

# Project Management Planning

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## The Process of Creating a Project Management Plan

Without a Project Plan, project success is difficult. Having an established project planning methodology helps the Project Team and all stakeholders reach the desired objectives faster, with a higher level of communication and effectiveness. Project planning drives this success.

### Importance of the Project Plan

A Project Plan is a formal, written document that is used to prepare for, manage and control a project. The Project Plan forms the basis for all management efforts associated with a project. It is a document that is also expected to change over the life of the project. The information associated with the Plan evolves as the project moves through its various stages and is to be updated as new information unfolds about the project in the planning, start-up and execution processes.

### What is Project Planning?

Project planning defines the project activities and describes how the activities will be accomplished. The purpose of project planning is to define each task, estimate the time and resources required, and provide a framework for management review and control. The project planning activities and goals include defining:

- The specific work to be performed
- Estimates to be documented for tracking and controlling the project
- Commitments that are planned and agreed to by stakeholders
- Project assumptions and constraints
- The size of the project in terms of dollars and resources
- Project schedule
- Project risks

Repetition of these major activities is necessary to establish the Project Plan. Typically, several iterations of the planning process are required to develop a good Project Plan.

### The Planning Process

The planning processes discussed in this document are conducted to ensure successful completion of project deliverables. The planning process includes a group of techniques that provides the detailed list of activities that are to be completed, by what role or skill, when and for how much. In summary, the project plan provides the specifics of:

- WHAT (objective, scope and statement of work)
- HOW (approach, work breakdown structures)
- WHO (project organization and resource schedule)
- WHEN (schedule and milestones)
- WHERE (facilities required)
- WHAT-IF (contingency plans for risk events)

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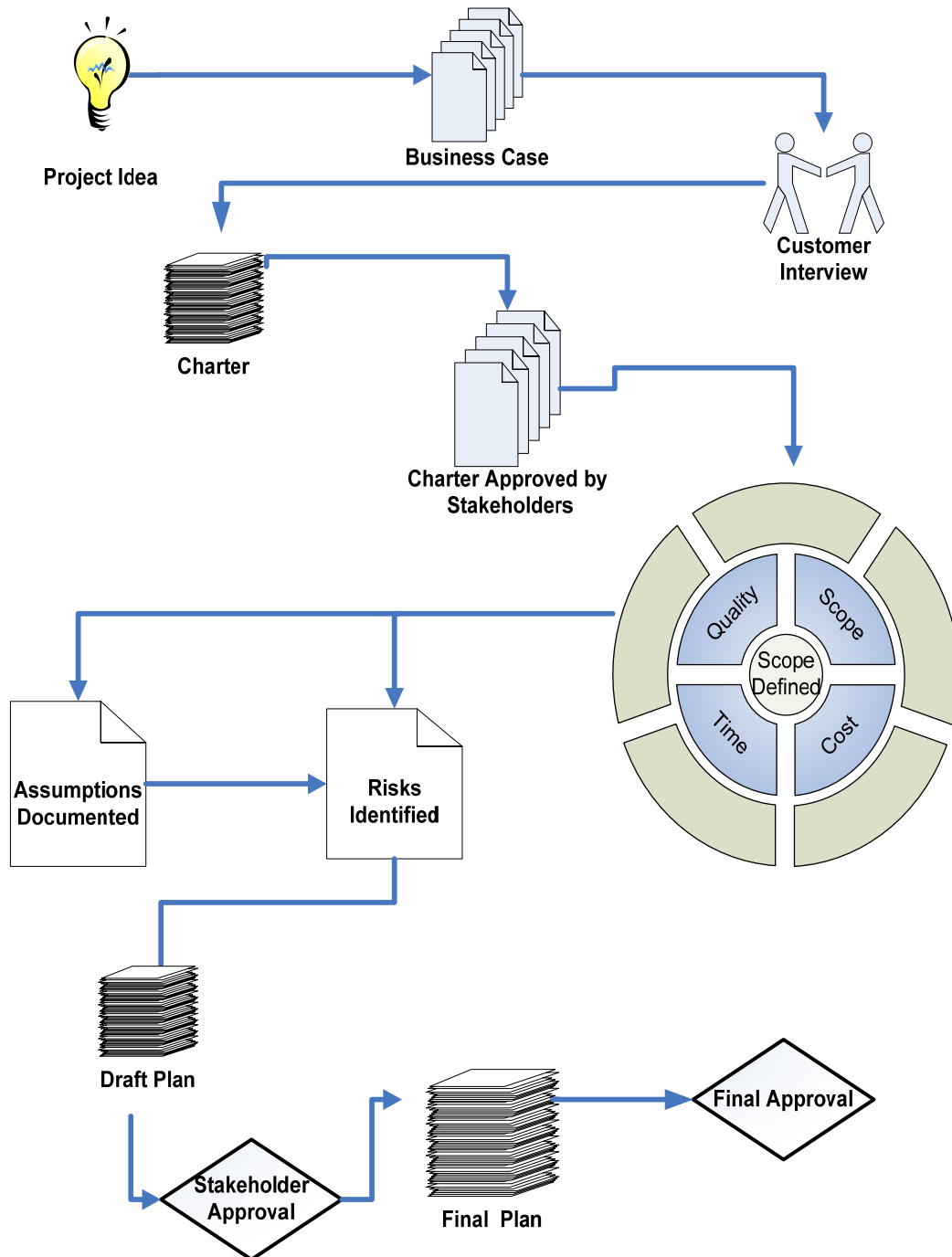
## Responsibilities for Planning

The responsibilities for project planning are summarized below:

- Project Managers are responsible for developing the Project Plan for a specific project. It is an activity, which requires training, focus and appropriate management and communication skills.
- State organizations and Project Managers are responsible for reviewing the guidelines developed by the Missouri Adaptive Enterprise Architecture (MAEA) committee before new technology projects are developed and enforced within an organization.
- State organizations are responsible for developing internal procedures to ensure that the planning process is completed in line with their own business plan. Projects must include plans that are well documented, based on realistic assumptions, support the key stakeholder goals and capable of being tracked and controlled until completion.
- State organizations are also responsible for assigning a Project Manager who has been certified by the State and for ensuring that there are adequate resources assigned to managing a project. Direct project management costs should not be rolled into overhead costs. Management time should be planned and controlled just like any other project resource.

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## Project Planning Process



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## Description of the Project Planning Process

The project planning methodology is very important for the establishment of progressive project management skills within the organization. Once the methodology has been taught and is consistently used, all team members, project managers, and stakeholders will begin thinking through the same process.

## Project Idea

Each project will usually start with an idea from the customer who expresses certain goals, objectives and deliverables. The idea could be driven by internal processes within the organization or by the need to make changes for better efficiencies.

The customer may be external or internal. In other words, the customer may be from outside the organization or may be part of the organization.

## Business Case

Creating a business case to justify and document the parameters of a project is very important. The business case documents the goals of the project and sets up the parameters of how the project should function. Clarity is established for both the Project Team and customer.

The business case may be created at two primary stages of a project. First, the business case may be created as an initiation process for justifying the project and the expenditure of money. When the business case originates here, the customer normally creates it to justify funding and the use of resources. The benefit of the business case being generated first is that the customer is able to document the benefits of the project. Second, the business case may be generated after the customer interview. When a business case is created at this stage, it is used as a supporting document to detail what the customer has indicated to the Project Team or Project Manager. In this situation, the business case will have different individuals designing it. It is possible that several different groups may give feedback and/or input into the case in order to document all deliverables needed.

It is necessary for the organization to establish a clear definition stating when and how a business case will be used. This means that each agency must determine at what level a business case should be used to justify the project and its outcomes. For example, a business case will be used on any project which is larger than 100 hours and/or \$25,000.

## Customer Interview

The customer interview is a meeting which involves the Project Manager and representatives from the Project Team. The purpose for this meeting is two-fold. The customer is able to detail the deliverables, goals and requirements for the project. Secondly, the customer has the opportunity to meet part of the Project Team and verbally explain what they are attempting to do.

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The customer interview should include some standard questions. Time, budget, scope, quality, and any anticipated hurdles should be addressed. Every project is unique; therefore, the time required for the number and detail of questions varies with each project. Through these questions, the Project Team gains information directly from the source and prevents misunderstanding down the road.

## Project Charter

The Project Charter is one of the initial documents created by the Project Team. The charter will include the title of the project, a description of the problem or business goal the project will address, the identification of the Project Manager, a statement of how much authority or priority this project will carry, identification of project constraints, and documentation of project assumptions.

After the Project Charter has been drafted, it is very important that the Project Team understands the goals and objectives of the project. All stakeholders should be involved in providing input for making adjustments and in giving final approval.

## Charter Approval by Stakeholder

Gaining approval from stakeholders is very important regardless of the project or its size. Approval signifies to the Project Team that they are going in the right direction.

The approval process for the Charter may be formal or informal. It may be a formal event with numerous signatures and documentation. It may be very informal with a simple verbal commitment. Each agency will determine what level of formality will be followed.

## Description of the Time, Cost, Scope, and Quality

Documenting a thorough description of the time, cost, scope and quality of a project is essential for understanding future project deliverables as well as setting proper expectations for the customer. A description of the time allotted for the project is very important because the Project Team will be held accountable to this time sequence. The budget is equally as important because the customer is expecting to have the project completed on time and within a budget as specified in this document. The scope will document the span of work which should be completed by this Project Team within an estimated time and budget. Lastly, the quality of this project is the level of performance expected from the beginning throughout the end of this project. Any deviation from this level of quality would signify that the Project Team is not meeting the desired requirements.

## Assumptions Documented

Documentation of all assumptions as part of the project planning process becomes critical in justifying and executing the project. The assumptions are presumed to be true and will be acted upon accordingly during the duration of the project.

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## Risks Identified

Risks can be defined as anything which might prevent or reduce the project from being on time, within budget and at the level of quality desired. Detailing the risks associated with the project points all stakeholders in the direction of understanding the analysis which the Project Team has produced.

## Draft Plan

Drafting a plan based on all the information detailed above is very important for gaining proper feedback from the Project Team and Project Sponsor. Drafting a plan allows the Project Manager the opportunity to nail down the parameters of the project in a more formal manner with the understanding that this Project Plan does not have every detail documented. Drafting a plan assists the Project Team in thinking through the process and procedures needed for proper fulfillment of the project.

## Stakeholder Approval

After the plan has been drafted and examined by the Project Team and the Project Sponsor, it should now be submitted for stakeholder approval. The stakeholders will now have an opportunity to examine the breakdown and time sequencing of the project. Any confusion or misinterpretation can be clarified.

## Final Plan

Once the project draft has been approved, the final plan is polished to include any adjustments specified by the Project Sponsor, stakeholders, or Project Team. The final plan must be documented with enough depth to show all milestones. This plan will be the document used from start to finish and will function as a baseline for comparison and performance. The Project Team should thoroughly go over the final plan in a closed meeting looking for any gaps or misrepresentations. Only after the Project Team is comfortable with the processes used in the timeframe should the final plan be submitted for final review.

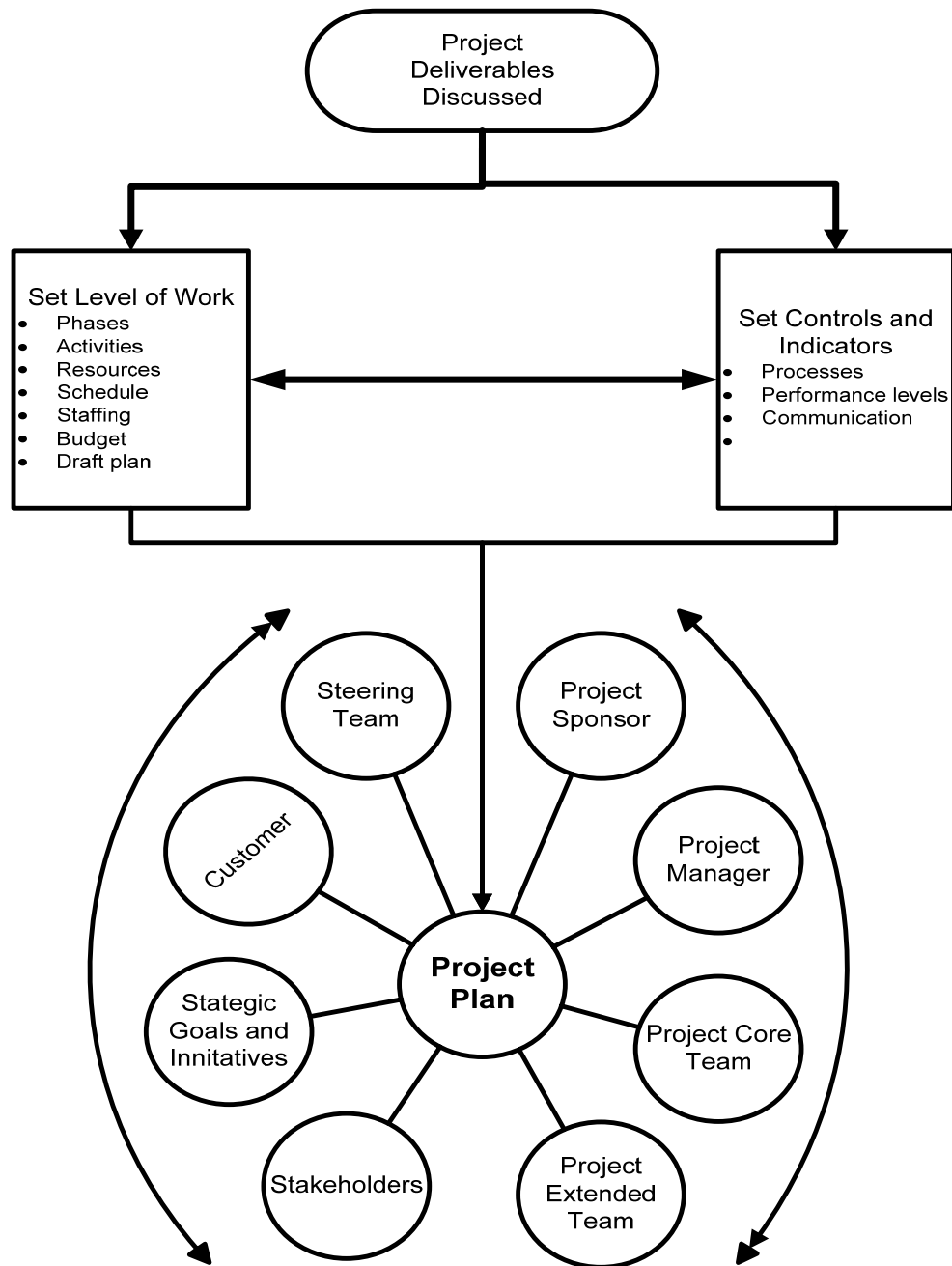
## Final Approval

The final approval of the project is the last step before the project officially begins. This step allows one final opportunity for the Project Sponsor and/or stakeholders to give input on the scope of the project. This approval freezes the scope and details how the project will be run. Any changes to this final approval must go through the change management process as determined by the agency and organization.

It is important that project plans are approved prior to beginning the start-up and execution processes. Even though these signatures are probably the last stage of plan development, they should be located at the beginning of the Plan to emphasize support for the Project Plan. In the template format, approval signatures are included within the first part of the Project Plan.

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## Project Planning Cycle



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## Project Planning Cycle

The project planning cycle has three different initiatives to verify the planning. Each can have numerous meetings and gathering of data to justify the decisions being made during the planning of the project.

### Deliverables Discussed

Project deliverables are discussed in the early stages of the project in a loose fashion and in generalities. Each deliverable will normally change in nature as to what will be included in the project.

### Set the Level of Work

Setting the level of work will influence the project planning process based on the expected priority of the project and how fast this project is needed. When the level of work is set, it will focus the project based on budget, resources and staffing.

### Set Controls and Indicators

Setting project planning control and indicators of how you will know when these controls have violated the standard assists in freezing the future scope of the project. Unless controls are set up front, the team will face unexpected changes with limited ability to anticipate future outcomes of the project.

### Cycle through Influencers to Project Plan

Each of the circles surrounding the project plan is an influencer to the project and the planning process. They can represent internal and external stakeholders. Each will either be making decisions on the project, seeking resources to carry out the project or influencing changes to follow. Regardless, all influencers must be considered in the planning process with understanding in how they can assist or hurt the project plan.

Regardless of the amount of time needed to gather the correct information from various components in this project planning cycle, a project scope will be clearer, and the customer will have a higher degree of satisfaction if communication and interviews are conducted to make sure there is an understanding of the goals, mission and vision of the project.



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## What is the Approval Process?

Quality assurance ensures that there is adequate review and approval of project deliverables. Approval is a formalized process ensuring that the appropriate levels of testing, review and sign-off have been completed.

The process of ensuring that appropriate approvals are obtained is part of the management function.

The approval process ensures that each project deliverable is successfully completed before the resources are assigned for beginning subsequent activities. This control process gives management a comprehensive view of the current project status. Information necessary to ensure that deliverables satisfy the specific business needs of the state organization is also received. Project approval also allows management to reassess the direction of the project and to provide input, as required.

There are typically three types of approval processes that occur during project execution. These processes are as follows:

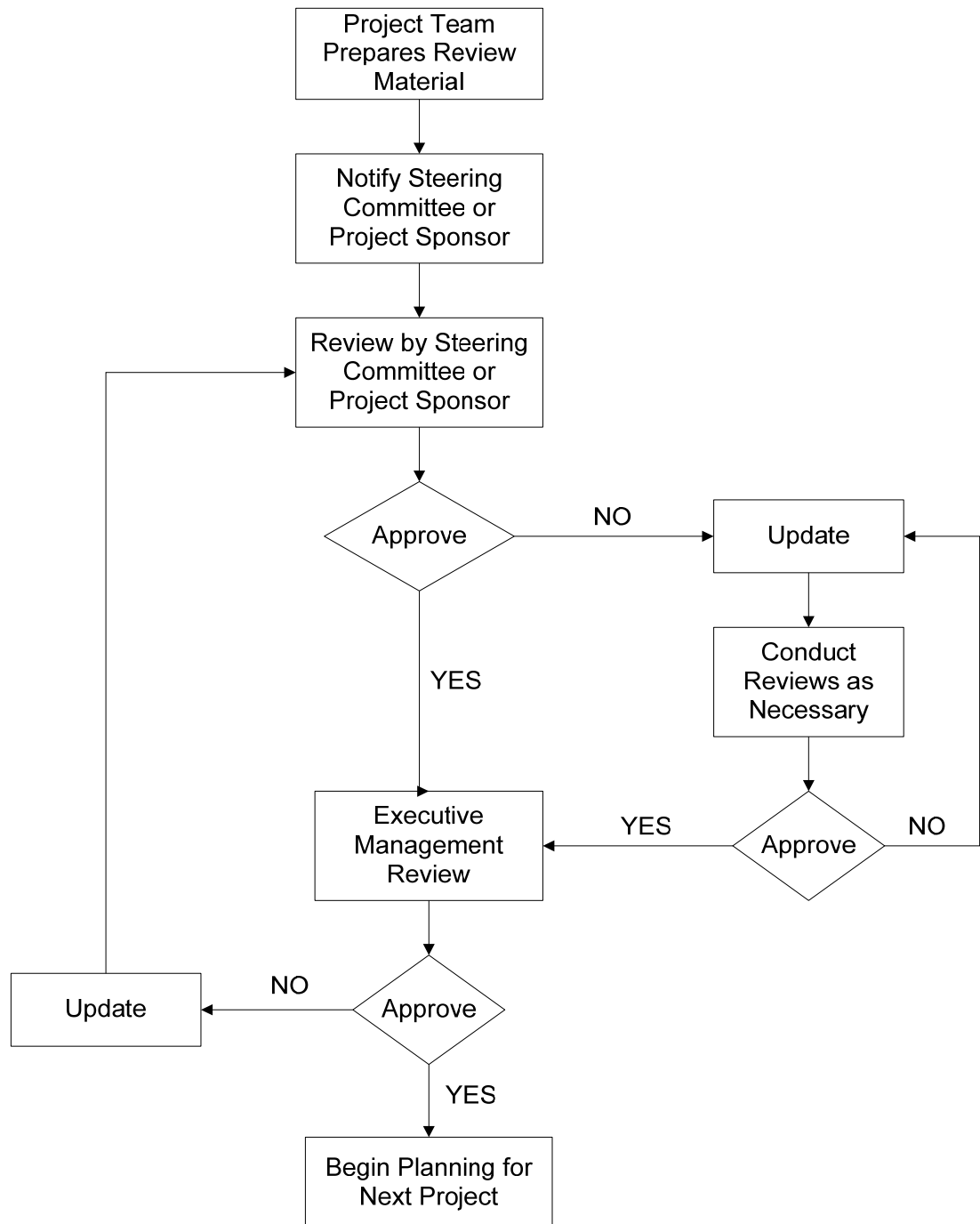
- ⌚ Project Plan and Plan changes, at the beginning and before changes are made to the baseline
- ⌚ Phase or project reviews, at the end of each phase or project
- ⌚ Deliverable reviews, as they are completed and at the end of the project.

Two of these approval processes are shown in the figures following this page.

The approval process sometimes triggers contractor payments. Many projects are designed for payment to contractors based on prearranged and negotiated deliverables.

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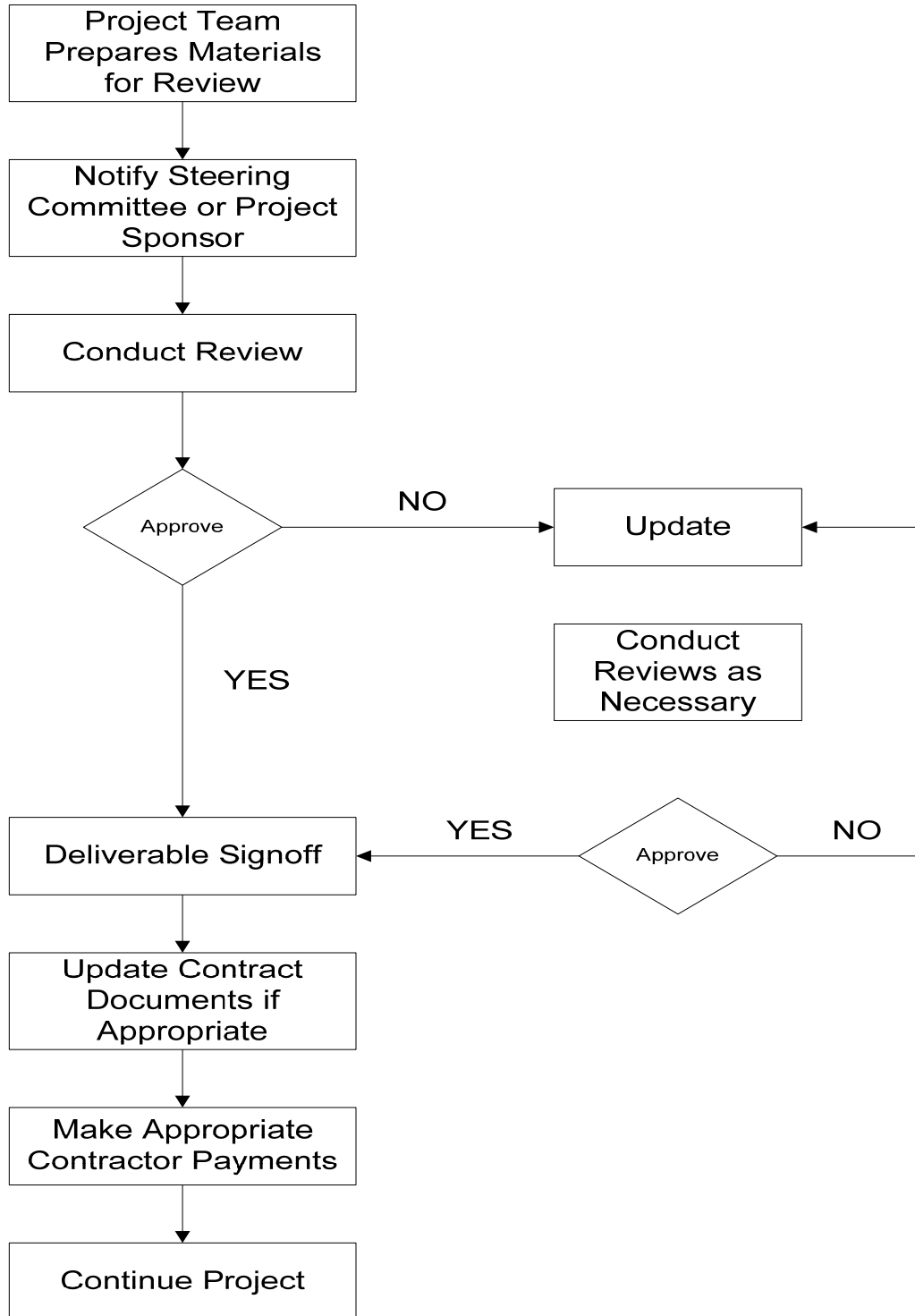
## *Sample Project Approval Process*



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## Sample Deliverables Approval Process



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The approval process takes place on two levels. First, the technical teams agree that a phase or project has been completed, and then a phase or project completion meeting is held to formalize the event and move on to the next phase or project. Documentation approval can also be formalized, but on a more limited scale, possibly among sub-sets of the Project Team. The figure below provides a sample of how one project summarized the deliverable approval process information.

## Deliverable Sign-Off Matrix

Document Name	To Be Approved by
Project Plan.....	Steering Committee
Test Plans.....	Steering Comm./Imp.Team
Quality Plan.....	Steering Comm./Imp.Team
Training Plan.....	Steering Comm./Imp.Team
Contingency Plan.....	Steering Comm./Imp.Team
Pilot Implementation Plan.....	Imp.Team/stakeholders
Roll out and Cutover Plan.....	Imp.Team/stakeholders
Maintenance Plan.....	Imp.Team/stakeholders
Handoff Plan.....	Implementation Team
Recovery Plan.....	Steering Comm./Imp.Team
Gap Analysis Report .....	Steering Comm./Imp.Team
Implementation Recommendation .....	Steering Committee
Re-engineered Process Flows.....	Steering Comm./stakeholders
Detailed Requirements.....	Steering Committee
Detailed Design.....	Imp.Team/stakeholders/Exec Mgmt/SC
Training Curriculum Certifications.....	Imp.Team/stakeholders

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## Steps in the Planning Process

The planning process consists of the following basic tasks:

- Define the problem, the goal(s), the objectives and the success factors for this specific project.
- Identify all deliverables associated with project.
- Identify precise and measurable milestones.
- Develop the project schedule.
  - Define the tasks to be performed.
  - Establish the general sequence and create the WBS.
  - Define the organization used to execute project.
  - Estimate task duration.
  - Estimate resources for each task.
  - Document task relationships.
  - Define critical path.
  - Establish start and end dates for each task.
  - Define and create the schedule.
- Define a budget for performing the tasks.
- Identify the known risks and suggested approaches to prevent or mitigate.
- Define the process used for ensuring quality.
- Define the process used for change management and project requirements.

### Project Management Plan Approval / Signatures Form

<i>Project Management Plan</i>	
Project Name: <u>Document Handling System</u>	
Date: <u>August 1, 2000</u>	
Plan Release #: <u>1.0</u>	
Project Manager: <u>John Smith</u>	
Approvals:	
<u>John Smith</u> Project Manager	<u>Betty White</u> Prime Contractor Manager
<u>Tom Snow</u> State Organization Management/Steering Committee Chair.	<u>Steve Brown</u> User Management
<u>Faye McNeill</u> Oversight Manager	<u>Peter Chan</u> Project Sponsor
CIO -(if Applicable)	
The above signatures represent agreement with the attached plan including agreement with the activities, the risks, the effort and the cost of the associated project.	

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## Points of Contact

*This should be the list of individuals who will be involved with the project during the execution process.*

Position	Name / Organization	Phone	E-Mail
Project Manager	John Smith	573-692-0962	smith@state.us
Senior Management Sponsor	Joe Done	573-752-1666	donej@state.us
Subject Matter Expert	Mary Lane	573-359-0993	lanem@state.us
Procurement Contract	Tina Black	573-425-1254	blackt@state.us
Customers: Audit Compliance	Bill Nick Anne Wright Lance Gonlin	573-694-3442 573-358-6996 573-536-8888	BNick@MDA.us Awright@MDA.us Lgonlin@MDA.us
Other Stakeholders (Top 3) Same as above			

## Prime Contractor Information

**Company:**

Position	Name	Phone	E-Mail
Project Manager	Betty White	573-664-3229	Bwhite@vquest.com
Senior Management Sponsor	Ned Jack	573-664-3869	Njack@vquest.com
Subject Matter Expert	Bob Bowman	573-664-3283	Bbowman@vquest.com

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## Creating a Project Schedule

### Activity Definition and Sequencing

The activities that need to be performed to accomplish the goals and objectives are specified in the work breakdown structure (WBS). Following the WBS, the activities are associated with time to create a project schedule. The project schedule provides a time phased representation of predicted tasks, milestones, dependencies, resource requirements, task duration and deadlines. The project's schedule consolidates all tasks into a logical and manageable flow. The project schedule should be detailed enough to show each WBS task to be performed, the title(s) of the persons responsible for completing the task, the start and end date of each task, and the expected duration of the task.

Like the development of each of the Project Plan components, developing a schedule is an iterative process. Milestones (significant points or events in the project) may suggest additional tasks, tasks may require additional resources and task completion may be measured by additional milestones. For large, complex projects, sub-schedules may be required to show an adequate level of detail.

During the life of the project, actual progress is frequently compared with the original schedule. This allows for evaluation of project activities and allows the team to calculate schedule variances against the baseline. The accuracy of the planning process can also be assessed to improve the planning process.

### Project Breakdown Chart

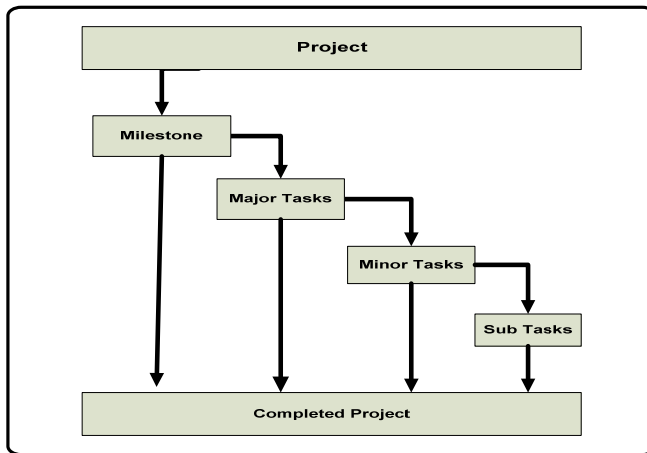
The Project Breakdown Chart below shows the various levels needed to complete a project successfully. Many projects can be assisted by breaking down in additional depth to show hidden activities and cost.

Levels of breakdown will be different depending on the size of the project. Break down the project into components which are small enough to be tracked with a high degree of efficiency.

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Project Breakdown Chart



## Develop Project Tasks

One of the most important parts of the project planning process is the definition of project activities (creating the WBS). Activity sequencing involves dividing the project into smaller, more manageable components or tasks and then specifying the order of completion. The goal is to integrate the WBS, the schedule and the budget into a written plan.

The WBS reflects all activities such as project management, requirements definition, design, implementation, transition management, testing, training or installation. The Project Manager is responsible for defining all tasks associated with a project and then further decomposing them as planning continues.

An activity list is typically shown in one of two ways. It can be shown as an outline or it can be graphically presented. Two samples of WBS are shown below. These samples are not complete but are provided for examples of format only.

## Example of WBS

1. MANAGEMENT
  - 1.1. Finalize Project Plan
    - 1.1.1. Review Project Plan with Project Team
    - 1.1.2. Update Project Plan to create new baseline
  - 1.2. Track Project
    - 1.2.1. Prepare status reports
    - 1.2.2. Collect/analyze project metrics
  - 1.3. Perform Quality Activities
    - 1.3.1. Conduct reviews
    - 1.3.2. Conduct audits
  - 1.4. Review and Act on Recommendations
  - 1.5. Perform Change Management
    - 1.5.1. Develop project library



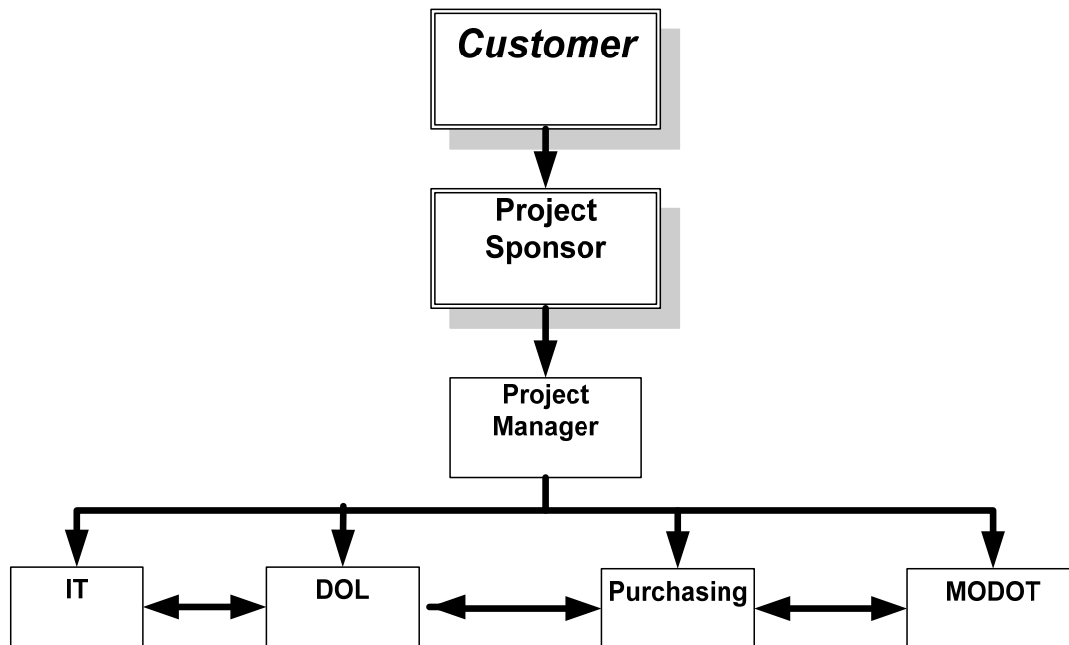
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- 1.5.2. Manage change board
- 1.5.3. Maintain change items
- 1.5.4. Report Status
- 1.6. Schedule and Conduct Status Meetings
- 1.7. Meet with Executive Management
- 1.8. Prepare Staff Evaluations
- 1.9. Conduct Close-Out Activities
  - 1.9.1. Finalize customer sign-off
  - 1.9.2. Conduct Lessons Learned
  - 1.9.3. Document PIER
  - 1.9.4. Archive records
  - 1.9.5. Celebrate success

Sometimes, instead of depicting the WBS as an outline, it is shown graphically, as below:

## Project Team Organization



WBS tasks are developed by asking, “What tasks need to be done to accomplish the project goals and objectives, develop the deliverables and reach the milestones?”

As levels of the WBS become lower, the scope, complexity and cost of each subtask become smaller. The lowest level tasks, or work packages, are independent, manageable units that are planned, budgeted, scheduled and controlled individually.

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As efforts of similar scope and type are planned, the basic WBS tasks remain somewhat similar, but each project requires a specific plan that addresses the uniqueness of the project's requirements. Certain top level elements, such as project management, are included in the WBS of every project, regardless of its type, size or complexity. Other items, like installation, may not apply to every project.

There is no simple formula to define how detailed a work breakdown needs to look. There are, however, some helpful guidelines for completion:

- Break down the work until accurate estimates of cost and resources needed to perform the task are provided.
- Ensure that clearly defined starting and ending events are defined for the task. This may correspond to the production of a deliverable or the occurrence of an event.
- Verify that the lowest level tasks can be performed within a “reasonable” period of time. If the time period to complete a task is too long, an accurate project status in the implementation process may not be possible. An industry standard rule of thumb is to make work packages that can be completed in timeframes of no less than 8 hours and not longer than 80 hours of work.
- Verify that people who work on the project are all assigned a WBS task. Have a firm rule: if the task is not on the WBS, it is not worked on.

The WBS evolves over the course of planning. It is highly probable that it will evolve even more as the scheduling, estimation and resource allocation portions of the plan are completed.

The WBS has multiple uses. It is both a task list for planning and a structure for providing report status during the implementation process. As individual low level tasks are completed, the project progress is assessed. It also serves as a useful management communication tool by which results can be compared with expectations.

Typically, in a small project, there is a single project development process. In large or complex systems, there are often multiple phases, which are then grouped into several projects.

Sometimes, these phases or projects are driven by the need to achieve certain levels of functionality prior to the availability of the complete solution. Other times, the projects are defined to partition the development effort and to reduce the risks associated with larger project efforts.

For large systems, the decomposition of the system into smaller components needs to be done early in the initiating process. The rationale for the decomposition must be known; otherwise, different results derived from different reasons for the system decomposition may occur. For example, if a project is defined simply to accommodate customer needs, the project may cross multiple functional areas of a system. If, on the other hand, a system is divided into phases simply to reduce risk, a functional division might occur where the projects represent completion of entire functional areas of the system. The way in which the projects are handled differs widely.

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## Define Task Relationships

If a project is a collection of phases, the WBS should define the different phases. Then, break the WBS down by deliverable.

The WBS denotes a hierarchy of task relationships. Subtask completion eventually rolls up into task completion, which ultimately results in deliverable completion, phase completion and project completion.

## Define Deliverables

Deliverables associated with the project are shown in the WBS and are reflected in the work product identification (WPI) portion of the Project Plan. A sample of a WPI template is shown below. All deliverables are listed in the order of planned development. As the schedule is created, the due date is filled in. The responsibility for the deliverable is assigned as it is known (typically when the organization chart is defined). The date delivered is a field that is filled in as deliverables are produced.

Over the course of the project, a comparison of the due date and the date delivered provides one metric for how well deliverable dates are met by the project team.

### Work Product Identification

Product Name	Due Date		Date Delivered	Author/ POC
	Projected Date	Actual Date		
Requirement Specification	W2D3			G. Brown
Design Specification	W18D1			G. Brown
Quality Plan	W30D2			B. White

While the deliverables list is a compilation of information identified in the WBS and the project schedule, it is useful to maintain a separate list since delivering deliverables on schedule is so important. Separate tracking of deliverables can help keep a project on track. It also serves as a useful communication tool for the Steering Committee for defining the status of the project.

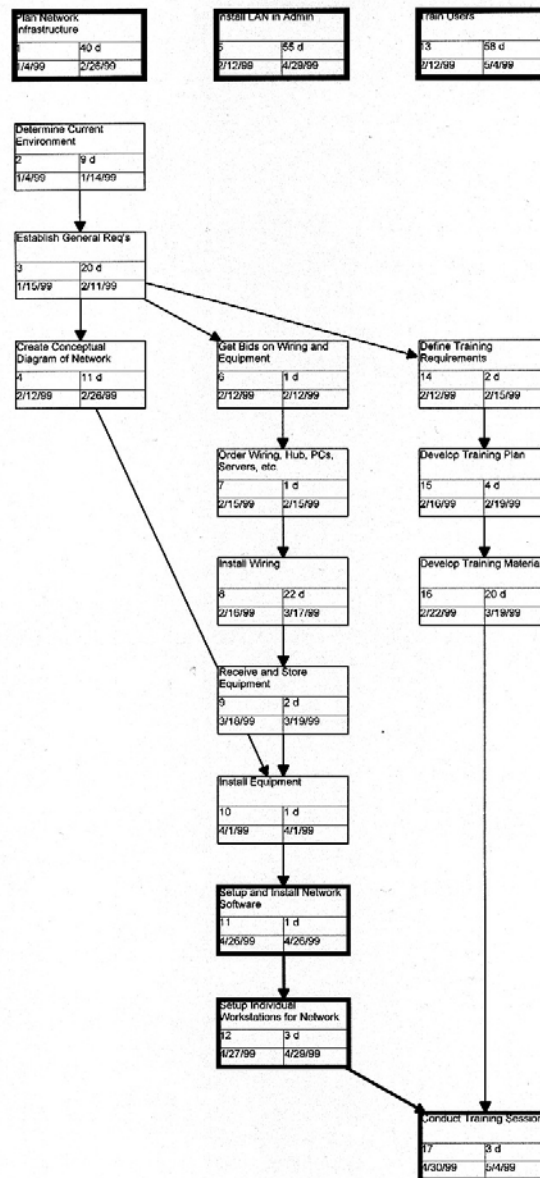
The WPI is a good example of what is referred to as a turnaround document. A turnaround document is something that is developed as part of the Project Plan and is used throughout project execution to report the status of the project. The WPI is updated in start-up with an actual date, the calendar date. As the deliverables are produced, the date of completion is placed in the date delivered column. This updated report is then included in the project status report.

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## Development of a Project Schedule

The following PERT chart is designed to clearly show the relationships between the tasks. It is an extremely valuable planning tool if the sequence of events is quite complex. However, using the PERT chart makes it difficult to show progress and to communicate status with the Steering Committee at a high level. The chart should be used only when the audience needs a detailed understanding of the task relationships.

Sample PERT Chart



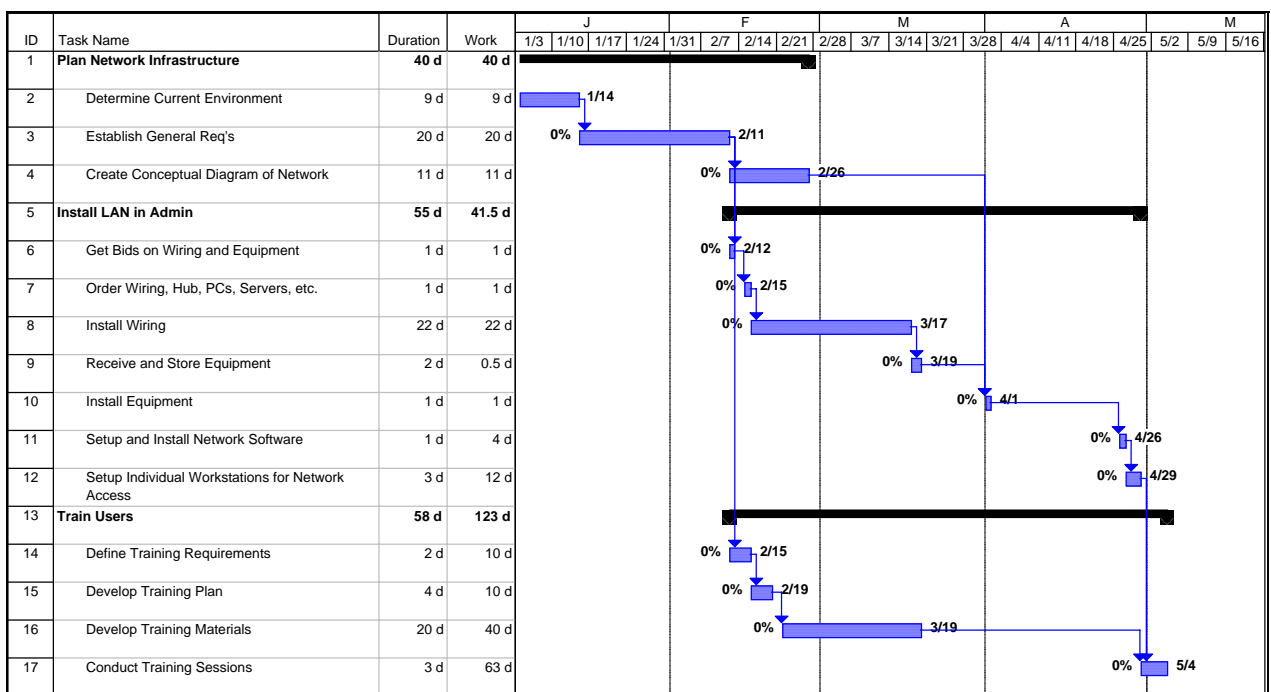
PERT is an acronym for Program Evaluation and Review Technique. The method was invented by the US Navy's Special Projects Office in 1958 as part of the Polaris mobile submarine launch

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project. This project was a direct response to the Sputnik crisis. PERT is intended for very large-scale, one-time, complex, non-routine projects.

Typically, a GANTT chart (or bar graph) is adequate. These schedules are two-dimensional representations that show the tasks and the timeframe for completion. Since task interrelationships are not easily shown on a GANTT chart, it is considered a weak planning tool for very complex projects. However, the GANTT chart is very common for reporting status and for defining the schedule. A sample GANTT follows.

**Sample GANTT Chart**



## Define Precise and Measurable Milestones

Key events are often denoted by milestones. These events typically have no duration. For example, deliverables often are represented as milestones, while the effort to produce the deliverable is referred to as a task.

While milestones are unique to each project, some example project milestones are shown below:

- 🕒 Requirements Approval
- 🕒 Phase Review Approval
- 🕒 Prototype Approval
- 🕒 Design Reviews Complete
- 🕒 Code Reviews Complete
- 🕒 Unit Test Complete

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- 🕒 Integration Test Complete
- 🕒 Acceptance Test Complete
- 🕒 System Accepted by Customer
- 🕒 Hardware Order Complete
- 🕒 Hardware Shipment Made
- 🕒 Hardware Received
- 🕒 Documentation Delivered

New project managers often struggle with milestones versus activities. The difference is easy to understand. An activity includes work performed over time, while a milestone represents an expected or completed significant event at a point in time. Also, in modern project management software, activities have associated durations of time, while milestones have a duration of zero.

Milestones occur at the end of almost any work package in the WBS. Major project milestones should be included in the project plan and schedule.

For contracted work, milestones are often used as a point in the project where interim payments might be made. If this approach is used, mutual agreement is necessary on the content of each milestone and the cost associated with that milestone.

## Create a Project Schedule

Activity sequencing involves dividing the project into smaller, more manageable components and then specifying the order of completion. The activity list form is a valuable tool for initially creating the WBS, and then by completing the remaining columns, a project schedule can be created.

### **Activity List (Sample)** **Work Breakdown Structure**

Provide an activity list (*work breakdown structure*) that describes each task required by the project

Task #	Task Name / Description	Roles	Elapsed Days	Work Hours	Start Date	Finished Date	Dependency	Cost
1	Business case drafted			80		1/2/XX		
2	Business case reviewed			20		1/2/XX	1 FS	
2.1	Business case finalized			20		1/2/XX		
2.2	Customer interview conducted			3		1/2/XX	2.1 SS + 5 days	
3	Draft requirements created			5		1/2/XX	2.2 FS + 3 days	
4	Requirements reviewed with customer			2		1/2/XX		
4.1	Requirements finalized with customer			2		1/2/XX	3 FS + 2 days	
4.2	Requirements list signed off			1		1/2/XX	4.1 FS + 5 days	
5	Draft project plan created			25		1/2/XX	4.1 SS + 3 days	
6	Draft project plan presented to sponsor			3		1/2/XX	4.1 SS + 3 days	
7	Project plan finalized			1		1/2/XX	4.2 FS + 5 days	

## Legend

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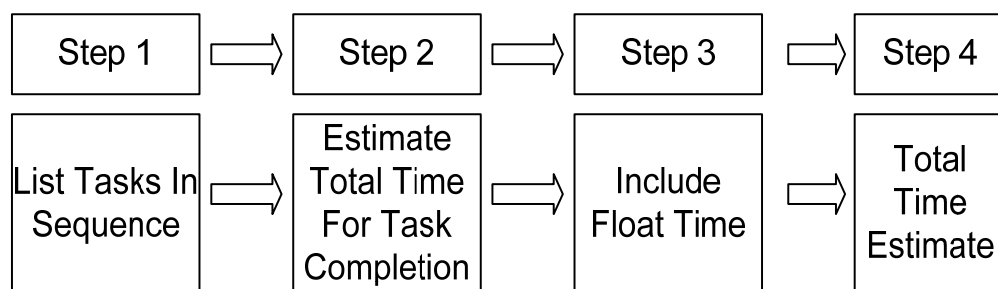
Activity # = the reference number of the activity, task and subtask  
Activity Name Description = a short description of the activity or task  
Roles = roles or positions assigned to the task  
Elapsed Days = calendar working days of the task from beginning to end; duration  
Work Hours = person hours associated with the tasks; used to calculate task cost  
Start Date = planned start date of the task  
Dependency = the type of relationship this task has with other tasks in the project  
Milestone = a key event in the project related to the completion of this specific task  
Cost = a place to identify and total task costs

## Estimate Task Duration

Estimating task duration will allow the Project Team to see the baselined time expected to complete a task compared to what it actually takes. The process of estimating correctly is important to minimize timeframes which have been calculated based on a guess rather than an analysis.

The estimation process can be conducted as defined below in four simple steps. Each step allows those with the responsibility of planning to increase their analysis and efficiency in estimating the time duration.

### Project Task Duration



#### Step 1 – List tasks in sequence

Breaking down a project into tasks is relatively common regardless of the software being used in project management. Each task is normally listed in order of sequence to allow the project plan to create a steady flow from start to finish.

The number of tasks will depend on the size of the project and to the depth desired for tracking. The Project Team may list only tasks or may list tasks associated with milestones. Tasks may even be divided into major, minor and sub-tasks.

#### Step 2 – Estimate total time for each task completion

# Project Management Planning

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After all the tasks have been listed in a sequence, it is time to estimate the time it will take to perform each individual task. In coordination with resources assigned to do the work, create a beginning and ending time to signify the length of effort needed to perform this amount of work. It is also beneficial to reexamine assumptions associated with each task to determine whether additional time needs to be calculated.

Task estimation must deal with reality and must have an objective estimation based on the performance of the organization and what other projects are currently underway. For example, it is not realistic to calculate your tasks with the fastest rate if your Project Team is already committed to working on another project. This means a Project Manager or Sponsor must give feedback and attempt to keep estimates realistic based on their resources and the amount of work presently being done. If an assigned resource on a task on day two of the project is also assigned to a different task on another project on the same day it may cause an over allocation. For example, if on "Project A" the resource is assigned to an eight-hour task on day two of the project and also is assigned to a four-hour or half day task in "Project B" on the same day the resource would be over allocated by 50% -- assigned to do 12 hours of work in an eight-hour workday. Project managers learn to be especially sensitive to resource availability when estimating task duration.

Some organizations will designate a certain amount of contingency or additional time that will be calculated for each task individually or added at the end to the overall time estimate. For example, an agency may state that the schedule must have 10% added to the total estimate in case anything has been overlooked.

There are several issues to consider when calculating task duration. Remember to always base your estimates on some easy-to-understand quantifiable parameters, for example:

- ⌚ **Historical data and past experience**
- ⌚ **Documents to be prepared:** number of pages assumed in the document times minutes per page.
- ⌚ **Proposals to be evaluated:** number of proposals to be evaluated times average number of pages times person hours per page.
- ⌚ **Requirements:** number of functional specifications, or number of technical specifications times person hours per requirement to generate and review.
- ⌚ **Tests:** number of customer audits, length of time it will take to conduct an audit times hours per audit.
- ⌚ **Training:** number of people to be trained times hours of training plus preparation, coordination and instruction.
- ⌚ **Meetings:** number of meetings times people involved times length of meetings. Be sure and include travel time and preparation time.
- ⌚ **Change Management:** estimated hours per week to include all time for change control board, documenting changes, issues and versions, completing analysis, and updating all associated files. Can range from 2 to 5% of total time.
- ⌚ **Quality Assurance:** number of reviews times person hours of review time. Include all involved personnel in your estimates.



# Project Management Planning

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Estimating using these techniques will improve the accuracy of the estimates and improve the communication between the Planning Team, the Steering Committee and the stakeholders.

## Step 3 – Include float time

Float time, or slack, is defined as time between the ending of one activity and the beginning of another. There are instances in a project in which a Project Plan will show float time between two activities. This float time is very important and must be calculated into the total project time sequencing.

It is important to be as honest as possible in calculating how long it will take to move from one task to another. If the Project Plan projects realistic measures, the probability for success is greater. The time calculation can be followed and met with little or no error.

## Step 4 – Calculate total time estimate

After listing all tasks in a sequence, create an estimated amount of time it will take to complete each task. Next, add float time between tasks. Calculate the total time estimate for this project. Make sure no task has been missed. Check to see that tasks have been broken down into subtasks when needed to reflect a true time estimate. This will reduce the possibility of the project running behind schedule.

## Define Priorities

Clearly defining the task priorities helps to resolve any scheduling and/or resource conflicts. Understanding the priorities and relationships of the tasks assists in resolving difficult scheduling conflicts.

## Define the Critical Path

The critical path is the longest path through a project. It determines the earliest possible completion of the project. The critical path is carefully managed because if critical path tasks slip, the entire project is delayed. In order to manage the project, the Project Manager determines the critical path and remains aware of its importance throughout the implementation of the Plan.

The successful scheduler considers availability of both labor and non-labor resources. Equipment availability on a long lead item often drives the critical path of a schedule. If installation equipment is required, for example, and the equipment cannot be delivered for six months, the installation phase is held up for that period of time.

## Document Task Relationships

After the WBS has been created, the tasks of each major section should be ordered into their logical sequence. Then, if tasks are dependent on each other, the task dependencies should be indicated. That is, if one task must be completed before another, then the first is a predecessor to the second, and the second task is a successor to the first. This relationship would be a **Finish-to-Start** relationship, i.e. the first task must finish before the second task can begin.

# Project Management Planning

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## Other task relationships include:

- **Start-to-Finish:** this task must start before the previous one can finish. A lead time can be added to indicate that this task must start x days before the previous task finishes.
- **Start-to-Start:** this task must start at the same time as the other task plus or minus lead time.
- **Finish-to-Finish:** this task must finish at the same time as the other task plus or minus lead time.

## Document Assumptions

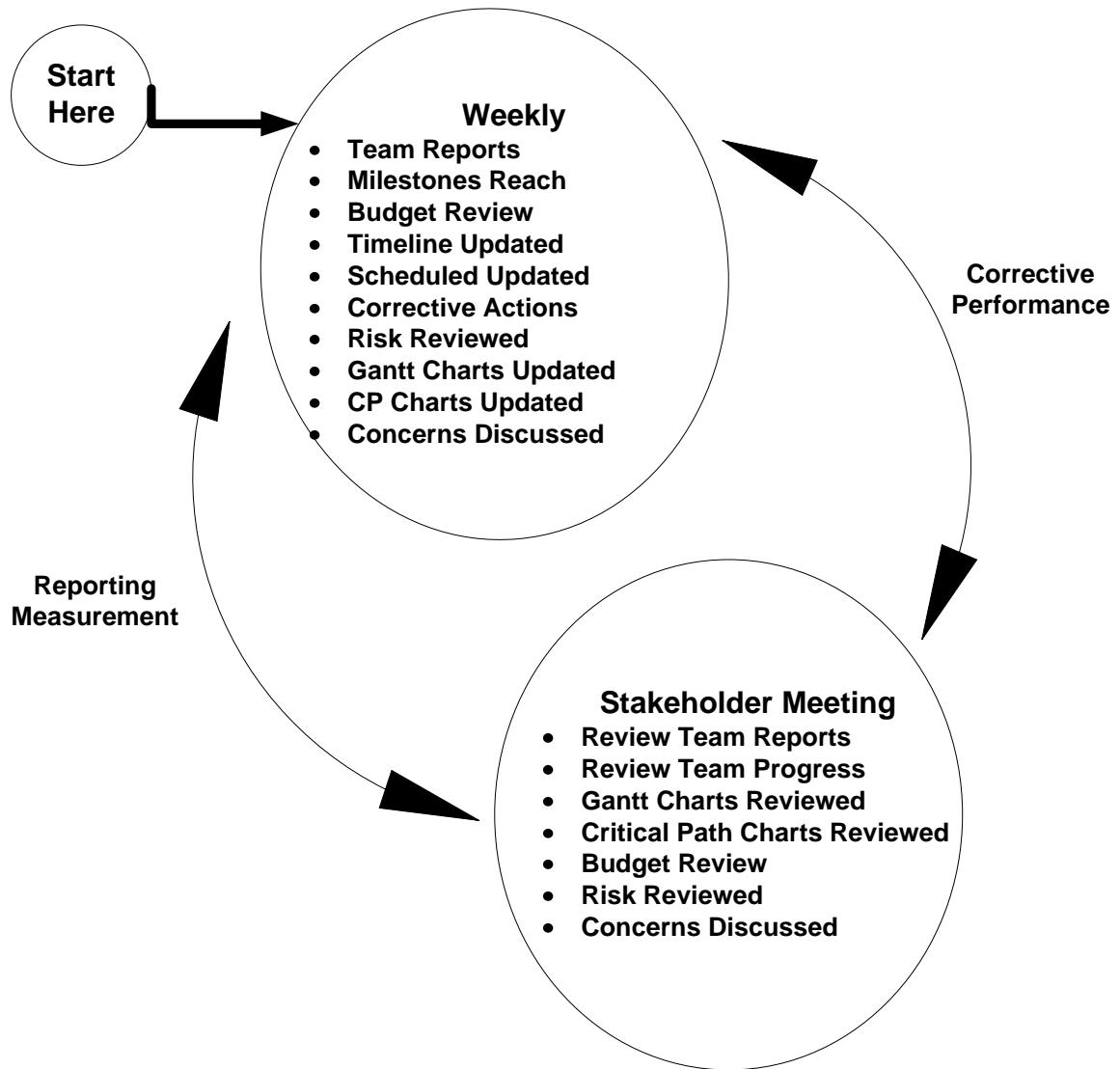
Documentation of the high level assumptions made in developing the project schedule is critical to the later success of the project. Assumptions are those aspects of a project that, in planning, are considered true, real or certain until proved otherwise. Without clear documentation of these assumptions, later changes to the schedule are very difficult and risky. Project Managers should strive to not only document the assumptions, but work hard to ensure that the Sponsor and Steering Committee members understand and agree with the assumptions.

If, for example, a schedule was shortened because it was assumed that a highly skilled person would be performing the work, that assumption should be documented. Then, if a less skilled person is actually assigned to perform the task, the Project Manager can recognize the risk and make necessary changes and decisions.

# Project Management Planning

## Communication Planning

### Project Status & Feedback Chart



# Project Management Planning

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## Project Status and Feedback Chart

The Project Status and Feedback Chart, above shows communication planning functions on two sides for reporting and taking corrective performance. During the reporting cycle, both stakeholder meeting and weekly updates allow everyone to understand how the project is progressing toward the deadline. What will be reported and to whom are questions which must be determined in the beginning of project planning.

## Reporting Measurement

Reporting during the weekly meetings keeps communication open and prevents mistakes and the missing of due dates. The reporting measurement includes keeping all documents updated with correct information for the purpose of providing all stakeholders the opportunity to adjust their milestones toward alignment.

Reporting measurements includes the usage of various reviews surrounding schedule, quality, budget and progress. Most of the reporting requires the updating of established charts such as Gantt, PERT, critical path and expenditure.

To report accurately the Project Manager must track accurately. To track a project, a baseline is set in the project schedule. Setting the baseline, a function of modern project management software, provides a snapshot of the project schedule at a point in time. As actual work is completed in the project it is documented in the schedule. Documenting actual work in a baseline schedule enables the Project Manager to measure actual progress against the baseline (against the expectation at a point in time) and also against the original project plan. Tracking helps the Project Manager control the project because it reveals variance, both positive (e.g., early finish, under budget) and negative (late finish, over budget).

## Corrective Action

During the reporting of the various measurements to the stakeholder, there will be times when adjustments to the project schedule, quality, performance and cost will be needed. These corrective actions are very important in handling workflow and for preventing future problems.

The balance between reporting and corrective actions is a never ending cycle throughout the planning of the project and its completion.

# Project Management Planning

## Communication Matrix

Stakeholder Name	Document Type	Frequency of Document	Who Will Provide	Type of Media
Bob Jones	Status report	Weekly	Project Manager	E-mail
Sam White	Budget update	Monthly	Project Sponsor	Hard copy

The Communication Matrix shown above points out the major categories which can be used in setting up the proper communication system for tracking and driving the project forward. This matrix points out the following sections:

**Stakeholders** – All stakeholders will be listed in this section. The stakeholders can include Project Sponsor, Project Managers, vendors or anyone included in the success of the project.

**Document Type** – Document type details which piece of communication should be given to the stakeholder. Not all stakeholders will need the same reports. Some will only desire to track certain sections of the project.

**Frequency of Document** - How often will the stakeholder need the communication pieces? Some will be needed on a weekly basis. Some stakeholders will need information less frequently, such as monthly or even quarterly in a large project.

**Who Will Provide** – Which person on the team will be responsible for making sure this information is given to the stakeholder? Some information will need to be provided by certain people due to the level of expertise or knowledge required. For example, there might only be one or two people who are tracking the cost of the project. Only those individuals can be responsible for providing the right information to the stakeholders pertaining to the cost of an item or budget expenditures.

**Type of Media** - In this section, there should be a determination as to which stakeholder wants what kind of information. For example, some stakeholders only want reports and documents to arrive electronically through e-mail while others desire only hard copies. Others may want to be able to log into a special website and see the information 24/7.

Regardless of which manner of communication or the media used to deliver the communication plan, it is very important to make sure project managers, stakeholders and customers are all informed consistently.

# Project Management Planning

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## Project Budgeting

Paralleling the development of the schedule is the development of a detailed project budget. This budget should include all internal and external costs including contractors, hardware, software, travel and other related expenses.

Budget estimates are refined in the planning process until they are baselined at project start-up. Budgeting serves as a control mechanism where actual costs can be compared to the budgeted costs. The budget is often the most important parameter in the execution of the project. When a schedule begins to slip, cost is proportionally affected. When project costs begin to escalate, revisit the project plan to determine whether scope, budget or schedule can be adjusted.

### Identify Cost Factors

To develop the budget, identify the applicable cost factors associated with the project tasks. The development of costs for each task should be simple and direct and consist of labor (internal and external), material and other costs. The cost of performing a task is directly related to the personnel assigned to the task, the duration of the task, the cost of any non-labor items required by the task and any allocated indirect cost. Non-labor charges include such items as material costs, reproduction, travel, the cost of capital (if leasing equipment), computer center charges and equipment costs.

Generally, budget estimates and associated assumptions are obtained from experts. Experts may be internal or external. This provides the expertise required to make the estimate and provides buy-in and accountability during the actual performance of the task.

The costs should factor in vacation time, sick leave, breaks, meetings and other day-to-day activities. Not including these factors jeopardizes both scheduling and cost estimates.

In calculating all known costs to include allocated fringe benefits of labor, be certain to burden the costs appropriately for your organization. A general guideline used by OA is 40% of salary to include fringe benefits. Burdened cost typically refers to the overhead and general expenses associated with an employee. These costs are office space, benefits, etc. and are beyond strict salary expenses. Burdened costs are also referred to as loaded rates.

### Use the Project Estimate Summary Worksheet

For large systems, a project management tool is typically preferred for cost estimation. A Project Estimate Summary Worksheet is a simple tool for costing smaller projects.

Costs are assigned to the lowest level WBS work package task. These costs are then combined to determine a sub-task cost. In turn, these are combined to determine the overall task cost, which can be summed to find the total project cost. This is an example of “bottoms-up” estimating, since we are estimating at the bottom and then rolling up the totals.

# Project Management Planning

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## Instructions for the Project Estimate Summary Worksheet

### Task Number

The number corresponds to the activity number reflected on the activity list and schedule. The numbering sequence is an outline format that corresponds to the work breakdown structure (WBS). Few projects require lower than three levels of sub-tasking. Each task structure should include deliverables and milestones. The work package or work assignment is normally at the second or third level of the sub-task.

Project Tasks	
1.	Task
1.1	Sub-task
1.1.1	Second level of sub-task
1.1.1.1	Third level of sub-task

### Task and Activity Name

The project's task and activity name is a brief description. This task description should remain consistent throughout the project plan.

Project Tasks	
1.	Project Design
1.1	Develop Functional Specifications

The remainder of the columns pertain to cost and hour details relative to a specific activity. The cost categories include: labor, material, travel and other.

Always start your cost analysis at the lowest level and total the lowest level tasks to the next level. All "x.x.x" would be added together to determine the value of "x.x" and all "x.x" level tasks would be totaled for "x" level. Finally, all "x" level totals would be totaled to get project total.

The project may require more than one line to complete the budget when multiple salary rates are used to determine "labor cost" for an activity. Labor cost is derived by multiplying labor hours by the labor rate. The Project Manager may either use an aggregate rate or specific multiple rates. For example, committee meetings could have a standard hourly rate which includes the rate for each attendee. The costs for each task should be totaled and put in "Total per Task."

At the end of the Project Estimate Summary Worksheet is a line for risk totals. Risk allowances are added to the project in terms of schedule (adding more time) and cost (adding additional cost to estimates). A Project Manager can do this in two ways: adding time and/or cost at the activity level; or adding time and/or cost at the end of the project. This information should come from your Risk Analysis Worksheet, which will be discussed in a later section of this chapter.

# Project Management Planning

The following is a sample of a part of a Project Estimate Worksheet.

## Project Estimate Summary Worksheet – Sample

Customer:

MDOT

Prepared by:

H.A.T.

Project:

MGT System

Date: 9-9-1999

WBS	Project Task	Labor Hour	Labor Rate	Labor Cost	Material Cost	Travel Cost	Other Cost	Total per Task
	:							
5.0	Define Requirements	624		24200	300	2500		27000
5.1	Define Goals and Deliverables	528		20040		2500		22540
5.1.1	Conduct Interview Sessions	320		12000		2000		14000
5.1.1.1	Schedule Sessions	8	30	240				240
5.1.1.2	Prepare for Sessions	24	40	960				960
5.1.1.3	Facilitate Meetings	24	40	960				960
5.1.1.4	Attend and Participate	240	38	9120		2000		11120
5.1.1.5	Document Meetings	24	30	720				720
5.1.2	Prepare Agenda	208		8040		500		8540
5.1.2.1	Prepare Documents for Stakeholders	80	40	3200				3200
5.1.2.2	Schedule Review Meetings and Distribute Document	8	30	240				240
5.1.2.3	Review the Documents	80	38	3040		500		3540
5.1.2.4	Meet to Gain Sign-off	40	39*	1560				1560
5.2	Define Technical Requirements	88		3824				3824
5.2.1	Review Missouri Best Practices Guidelines	16	42	672				672
5.2.2	Review Current Policies and Procedures	16	42	672				672
5.2.3	Review Agency Plan	16	42	672				672
5.3	Prepare Consolidated Requirements Documents	8	42	336	300			636



# Project Management Planning

WBS	Project Task	Labor Hour	Labor Rate	Labor Cost	Material Cost	Travel Cost	Other Cost	Total per Task
Other:								
Sub-Totals:								6XX,XXX
Risk (Reserve) From Risk Analysis Worksheet								7X,XXX
TOTAL (scheduled)								69X,XXX
Comments: <i>(List assumptions for costs as appropriate.)</i>								
* Blended Meeting Rate								

## Document Assumptions

As with developing a project schedule, documenting assumptions made while developing the project budget is critical to the success of the project. Without clear documentation of these assumptions, explaining the Project Plan to stakeholders is difficult. Also, tracking the Plan against budget is very difficult.

If, for example, a budget assumed that the material would be acquired at one price rate and only substantially higher cost material was available to perform the task, there would be a budget problem. If the assumption is not documented, the Project Manager may inadvertently or unknowingly increase project cost and may jeopardize chances for the project's success.

No.	Assumption Described	How Will This Be Tracked	Signals This Assumption Is Defective	Risk Mitigation Plan
1	<i>Project is high priority as detailed by management and resources will be allocated accordingly</i>	<ul style="list-style-type: none"> <li>• Monitor input of work hours and budget</li> <li>• Calculate length of time it takes to get response from leadership</li> </ul>	<ul style="list-style-type: none"> <li>• Team is moved to other project with little justification</li> <li>• Communication breaks down with sponsor</li> </ul>	<ul style="list-style-type: none"> <li>• Bi-weekly meetings with sponsor</li> </ul>
2	<i>Project core team will be part of the team throughout the entire project duration</i>	<ul style="list-style-type: none"> <li>• Discuss need to have core team dedicated to this team for its entirety</li> <li>• Monitor the number of other projects the team is being asked to serve on at any given time</li> </ul>	<ul style="list-style-type: none"> <li>• Team is overcommitted to other projects which have short deadlines</li> <li>• Team has more than 90% of their weekly worker hours committed</li> </ul>	<ul style="list-style-type: none"> <li>• Meet with sponsor and discuss freeing up core team to something more balanced</li> <li>• Create a list of optional team members who are highly productive</li> </ul>

# Project Management Planning

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## Review the Cost Estimates

Development of project budgets typically requires more than one person. Rarely, if ever does a single individual have the knowledge and understanding of all the factors affecting every aspect of a project.

Upon completion of a draft budget, interview the team and other experts and determine if the work descriptions, schedule and associated budgets are complete and reasonable. Get independent estimates. Where there are significant differences, determine the reasons and either redefine the work packages, schedule and budgets, or review and reiterate the estimates. The total labor days should be verified against industry standards or expert opinion in the development of project effort and cost.

## Create the Estimate at Completion Report

One type of budget report, which will become part of the Project Plan, is the EAC or estimate at completion summary. It reflects the anticipated cost and hours of the planned project.

### Estimate at Completion Summary

WB S No.	Activity Description	Analysis in Hours					Analysis in Dollars				
		Budget Hours	Actual Hours	Est. to Complete	Est. @ Compl ete	Varianc e (+ = More)	Budget \$	Actual \$	Est. to Comple te	Est. @ Compl ete	Varian ce (+ = More)
1.0	Define Requirements	430	0	430	430	0	17,780	0	17,780	17,780	0
2.0	Prepare RFP	572	0	572	572	0	22,880	0	22,880	22,880	0
3.0	Issue RFP and Evaluate Vendors	433	0	433	433	0	17,320	0	17,320	17,320	0
4.0	Close-Out	72	0	72	72	0	2,880	0	2,880	2,880	0
	TOTAL	1,507			1,507	0	60,860			60,860	0

# Project Management Planning

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## Change Management

For our purposes, change management includes the processes, procedures and tools to control project deliverable(s) in terms of release and revision; to monitor project scope against the baseline; and manage approval on any change to the baseline, e.g. product and project scope. It also includes the following other concepts and definitions:

**Control item** is a project element that is considered a unit for the purpose of change management. This includes such things as software modules, versions of software systems, the project design document, the project plans and so forth. A control item, sometimes referred to as a control element, is anything under the control of the Change Manager.

**Change control** is the process of controlling, documenting and storing the changes to control items. This includes proposing the change, evaluating it, approving or rejecting it, scheduling it and tracking it.

**Version control** is a process used to control the release and installation of versions. This includes recording and saving each release and documenting the differences between the releases.

**Issue control or management** is a process that provides a mechanism to document, research and resolve issues that arise during project planning and execution.

**Action Item control** is a process that provides a mechanism to document and track action items that arise during project planning and execution.

## Change Management Organization

Effective change management requires an effective and well-defined role and process. The change management role is responsible for:

- ⌚ Defining who will be responsible for and have authority over change management processes.
- ⌚ Setting standards, procedures and guidelines for the full project team to follow.
- ⌚ Defining tools, resources and facilities to be used for change management.

This information is summarized in either a standard change management policy manual and/or in the Project Change Management Plan. The detailed change management information is represented as a summary page in the Project Management Plan.

# Project Management Planning

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## Create an Agency-Wide Change Management Plan

A sample Change Management Plan outline is shown below.

### Sample Outline for a Change Management Plan

1. Change Management organization and resources
  - 1.1 Organization structure related to CM
  - 1.2 Personnel skill level and qualifications for CM
  - 1.3 Facilities needed
  - 1.4 Equipment and tools used
2. Standards, procedures, policies and guidelines
  - 2.1 Diagram of information flow
  - 2.2 Rules for documentation and approval
3. Change identification
  - 3.1 Method for defining control item
  - 3.2 Method for change control
  - 3.3 List of potential control items
4. Identification methods  
(Naming and marking of document, software components, revisions, releases, etc.)
5. Submission and retrieval of control items
6. Version control
  - 6.1 Preparation of software and documentation versions
  - 6.2 Release approval procedure
7. Storage handling and delivery of project media (both digital and manual documents)
8. Relationship to contractor change management (include their plan and procedures if separate from state's processes)
9. Other information

## CM Tasks Completed during the Planning Process

During the planning process, the Project Manager defines the group or persons responsible for project change management and refines the procedure and required resources, if necessary, for performing change management. During the planning process, the Project Team also identifies the control items. The goal is to:

- ⌚ Explicitly assign change management's authority and responsibility for the project.
- ⌚ Ensure that change management is implemented throughout the project's life cycle by setting standards, procedures and guidelines that are produced and distributed to the full Project Team.
- ⌚ Ensure that project management has a repository for storing change items and associated change management records.
- ⌚ Ensure that quality and change reviews are being completed on a regular basis.

## CM's Relationship to Quality Management

Many of the issues related to change management are similar to the issues related to quality assurance. In fact, in software development projects, many of the tasks for quality and change management overlap. For this reason, a clear definition needs to be established, even at the planning stage, as to who will play what role.

# Project Management Planning

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## Authority and Responsibility

Every project includes some activity that requires change management. The responsibility for change management is assigned in the Project Plan.

The change management authority and responsibility can be handled in the following ways:

1. The state organization maintains a standard, enterprise-wide approach to change management and has an identified group responsible for these tasks on all projects undertaken.
2. The project develops a sub-team within the project management structure to perform change management. This team may be assigned to the project on a full-time or part-time basis depending on the size of the project.
3. Contracted services.

In all cases, both the authority and the responsibility for all roles and activities must be clearly defined.

## Control Items

During project planning, the person responsible for change management and the Project Manager defines the elements placed under change control. The list of control items is not standard. The best place to start is with the activity list or work breakdown structure. Typically, all major deliverables are controlled.

Some of the more specific considerations include:

- ⌚ Project Management Plan (schedules, budgets, and contracts), support function plans, and correspondence and other documents necessary to recreate a project.
- ⌚ Requirements document, RFP, documentation, training materials.
- ⌚ Communication plans, status meetings and progress documents.

## Change Management Procedures and Policies

Procedures and tools are necessary to ensure successful implementation of a change management process.

The plan also contains information on how the detailed procedures will be developed and specifies that these procedures are in place by project start-up. Some key processes to be addressed in the procedures include:

- ⌚ How do Project Team members request and retrieve change control items?
- ⌚ What are the numbering, sequencing and data processes to be used?
- ⌚ Does the project contain sensitive or security-driven data; if so, will the change management processes meet the control requirements for this data?

# Project Management Planning

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- ⌚ Where is the location of controlled items, and how does the Project Team get access to them?
- ⌚ What items will be placed under automated control and what items will be manually controlled?
- ⌚ What is the relationship to the Quality Assurance and Quality Control Teams?

The plan may also include diagrams and flow charts to describe procedures for submitting change requests and for reporting problems.

## Storage of CM Control Items

Ensure that the Project Team has a repository for storing change items and associated change management records.

The change management environment should include the resources necessary for the implementation of the Change Management Plan. This includes:

- ⌚ Change control tools for automatic version control and change control tools.
- ⌚ Storage facilities -- a safe repository for all approved change items, including:
  - 🔑 On-site automated storage for the day-to-day development process.
  - 🔑 On-site paper storage for the day-to-day project for change control items that are not stored in automated form.
  - 🔑 Off-site storage for disaster recovery.

Change management is one area in which many automated tools exist. Automated change control works well when used in a multi-customer development environment, such as a LAN (local area network), to facilitate the sharing of project information and data and to allow for consistent application of the change management procedures. Controlled elements can be stored in a central database, and developer access is managed from a central change control system. Without such a system, added manual controls and additional tasks for the developers may need to be imposed. A multi-location development environment could especially work more smoothly with automated tools.

## Change Management Goes Beyond Development

Change management is a process that continues beyond the project development cycle and into the maintenance and operation processes. A project that has clearly implemented a successful change management process adds to the value of the system once it reaches maintenance.

## Example of a Change Management Plan

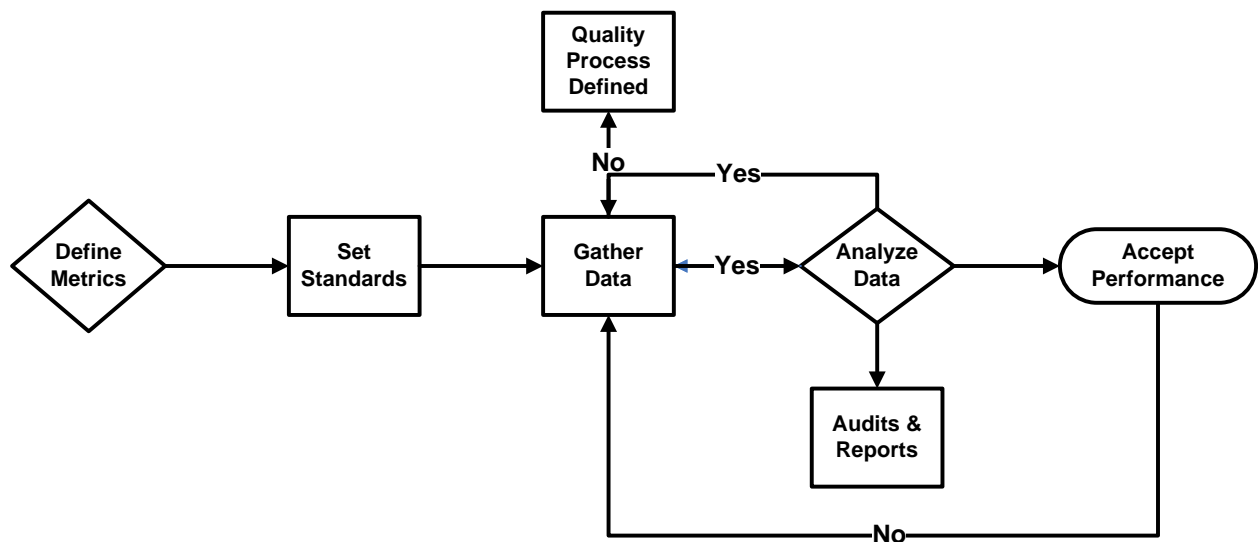
Refer to Appendix B: Forms, to review the layout of the document.

# Project Management Planning

## Quality Assurance

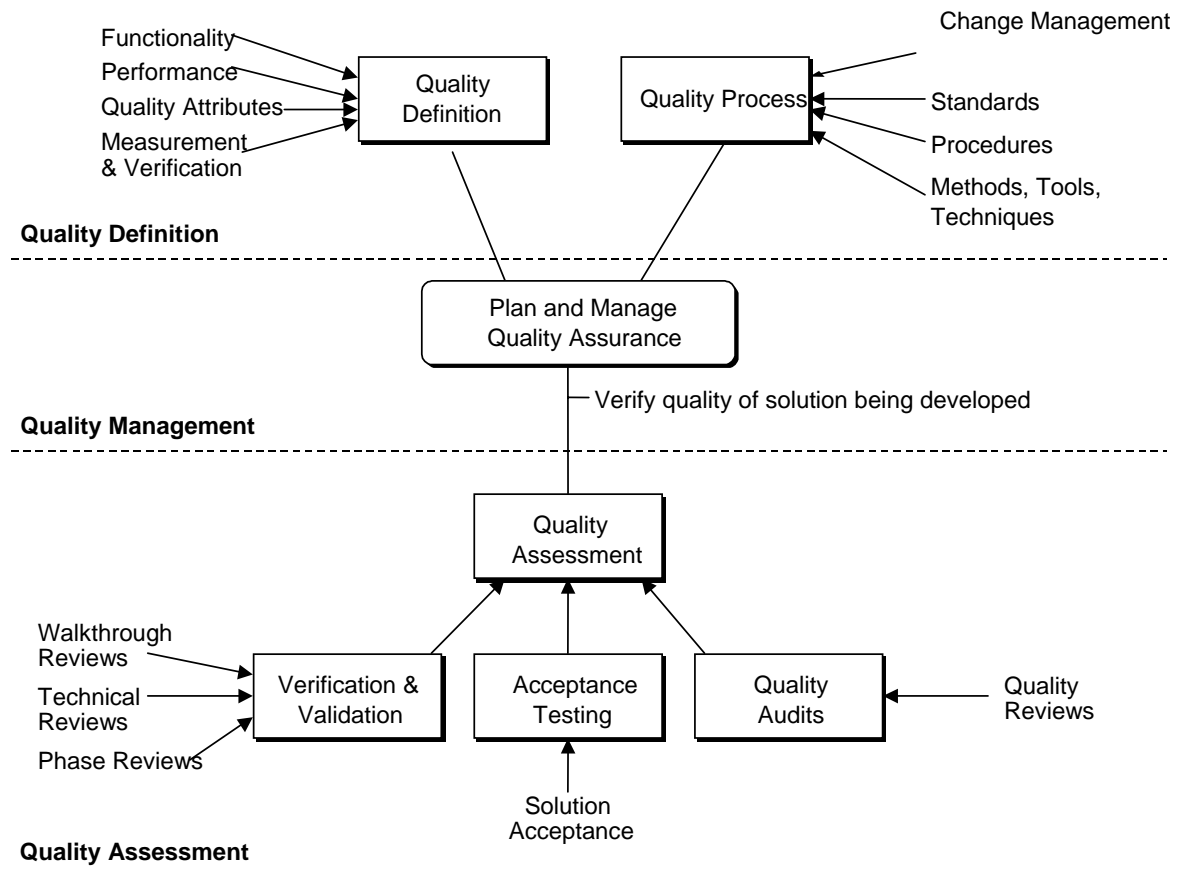
The Quality Plan identifies the procedures and activities that the Project Team executes for quality. A detailed quality model should be maintained by each state organization, and this model should describe the quality procedures that are used for projects. The following model defines a quality assurance process that is consistent with ISO (International Standards Organization) 9000 standards.

### Project Quality Process



# Project Management Planning

## Quality Assurance Model



## Creating the Quality Plan

The state organization's quality model should be based on standards and procedures that enable the Project Manager to ensure quality throughout the life of the project by:

- ⌚ enforcing quality standards and procedures through formal reviews, walkthroughs and inspections
- ⌚ tracking and reviewing defects at each phase of the project
- ⌚ ensuring all approved project management activities are properly planned and executed.

Most projects will not require a "unique" Quality Plan, but can be completed under the standard process. For large or complex projects a customized Quality Plan may be needed. The Quality Plan describes how the project implements its quality process and defines the processes that will be taken to prevent and remove defects. It is important to consider the quality goals early in the project and ensure that quality activities are integrated into the overall Project Management Plan.



# Project Management Planning

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The Quality Plan identifies the role or roles responsible for the quality assurance activities, identifies the scheduled quality activities, and identifies the resources required to conduct the activities. Quality activities are included in the project schedule.

Successful quality processes always strive to see quality through the eyes of the customer. The customer is the ultimate judge of the quality of the product they receive. They will typically judge a project by whether or not their requirements and business objectives are met. To ensure delivery of a quality product, each phase of the project should ensure that requirements are addressed.

It is also important to include a process that validates that the currently defined requirements will be satisfactory to the customer. It is counterproductive to develop a system that meets a documented requirement if you and the customer know that the requirement has changed. The change management process helps to control the number of such changes, but quality processes must be in place in order to make changes when they are necessary.

## Responsibility for Quality

The Project Manager has overall responsibility for the quality of the final product. But, every Project Team member needs to buy-in to the responsibility for doing quality work. Through ownership of the organization's quality policy, the individual team members become the most effective way to implement quality into products efficiently and completely. A quality policy cannot rely on "adding" quality at the end of a process; it must be built into the work of each individual on the team. This is why it is important to see quality assurance reviewing as a process. It is far more cost effective to have team members add quality into their day-to-day jobs than to have a quality analyst find a problem after a process has been completed.

## Independence of the Quality Assurance Team

The Quality Assurance Team assures that the Quality Plan is executed as planned. This Quality Team coordinates with the Project Manager but must also have a reporting chain outside the project to facilitate problem escalation. Problem escalation is the process of moving a problem to a higher management level if sufficient attention is not given by the Project Manager. The independent reporting chain provides a check and balance on the project.

## Using QA Checklist

Quality checklists are often developed as part of the quality procedure definitions. The checklists and associated quality procedures are developed individually by each state organization and by each Quality Assurance Audit Team.

The Quality Plan overview for the project is included in the Project Management Plan.

## Example of a Quality Assurance Plan

Refer to Appendix B: Forms, to review the layout of the document.

# Project Management Planning

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## Requirements Definition

### Importance of Project Requirements

Requirements definition in the planning process is one of the most crucial steps in the process of creating a Project Plan. Without defined requirements managers cannot realistically define the roles and skills that will be needed during the execution process. In many cases, without a high-level definition of the project requirements, the tasks needed to execute the project can not be known. This makes precise planning impossible.

#### **What is a Requirements Process?**

**The disciplined application of proven methods and tools to describe the intended results of a project and its associated constraints**

### When are Requirements Defined?

Project requirements evolve over time. At each process, planning or execution, additional information is derived and documented. At the onset of the initiating process, for instance, basic business needs are expressed and documented. It starts with a business problem statement within the project charter. The statements are high level and may be met by a combination of automated and manual processes. For example, a business problem might be: "The system must support timely payment of invoices."

Over time, these needs are refined and developed into functional customer requirements and are later developed into detailed technical specifications.

During project planning, product requirements must be understood in enough detail to develop project budgets and define resources needed to implement the solution. It is highly recommended that a Business Case is developed on all medium to large projects.

A Project Team should never commit to the project activities list, schedule or budget to build something unless or until the high-level product requirements are defined.

At project startup, requirements are reviewed to ensure that they are clear and that the Project Team has an understanding of the requirements. Areas where additional definition is required are noted and logged as action items. In many cases, taking the high-level requirements and refining them into detailed requirements will be defined as work assignments within the Project Plan.

# Project Management Planning

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## Who Defines Requirements?

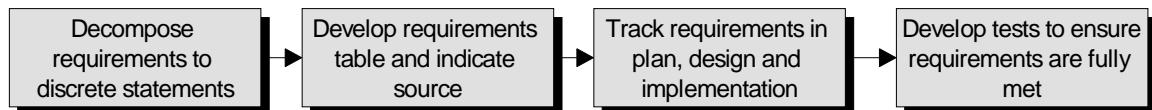
Requirements definition is a difficult task. People often have difficulty expressing needs without immediately attempting to define the solution. It is also hard to conceptualize how new automation will affect a task that is currently being done manually or with older technology.

Requirements definition is a communication intensive process, and, unfortunately, technologists and subject matter experts have different vocabularies, backgrounds and preferences. This makes the specification process difficult.

For more complex systems, prototyping of customer screens and reports can help facilitate the communication process. With a prototype, customers can see samples of how the system operates, and the developers can provide detailed information that the customer group can comprehend.

## Requirements Traceability

The requirements process ensures that the requirements defined in the functional specification are carried through planning, execution and testing. Requirements definition performed during the planning might be done at a very high level. The traceability process involves the following steps:



Requirements traceability is facilitated by breaking down requirements into lower and lower levels of detail. Often requirements that are not broken down result in some ambiguities, such as:

- ⌚ Multiple requirements may be embedded in a single sentence.
- ⌚ Compound conditions to requirements may exist in a single sentence (i.e. and/or conditions).
- ⌚ Requirements may not be testable or determined as met.
- ⌚ Requirements may be inconsistent.

By placing each requirement as an individual statement that can be tracked and accounted for, the Project Team can ensure that stated needs can be traced. The first traceability can occur when the WBS is completed. Each requirement is reviewed to ensure that there is a task defined for fulfilling that requirement. Allocation of requirements to the WBS helps define the WBS element and indicates the scope of work covered by the item. This definition allows for a more careful estimate of schedule, budget and resources in the planning process.

A sample requirements traceability table is shown on the following page:

# Project Management Planning

## Project Requirements Project Traceability Table Product Scope Statement

Documents product specifications with appropriate cross-references to other documents

No.	Requirement	RFP Reference	SOW Reference	Task Reference	Specification Reference	Completed	Comments / Clarification
1.	The system shall incorporate a well defined help function	2.2.10 2.4.2	S01230	S01230	SSS 3.2.6.4	Yes	
2.	Function key macros and /or other shortcut techniques shall be provided for "power users"	2.2.10	S01230.1	S01230.1	SSS 3.2.6.4	Yes	
3.	The system shall require each user to sign on to the system with a password	2.2.10 2.4.2	S01230	S01230	SSS 3.2.6.1	Yes	
4.	The average response time to all entries shall be 1/2 second or less.	2.2.10	S01230.1	S01230.1	SSS 3.2.6.1	Yes	Yes
5.	Any data item shall only have to be entered once.	2.2.10 2.4.2	S01240	S01240	SSS 3.2.6.1	Yes	
6.							
7.							
8.							
9.							
10.							

SOW = Statement of Work

Numbering each requirement with a unique identifier further facilitates reference to the requirement for the purposes of contract, engineering, quality assurance and project management.

Where appropriate, columns can also be added that assign the requirement to a category for sorting. Also, as the project progresses, there can be references to the test plans and procedures, and a compliance field can be entered to define which requirements have been fulfilled and tested.

This requirements analysis process allows specific requirements to be uniquely identified and serves as a common method between developers, customers and the Project Management Team. It facilitates general communication, traceability and provides a method for controlling requirements changes.

# Project Management Planning

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## Approving the Requirements Document

Requirements documents are approved by the Project Team, the customers, and the Steering Committee. Specifications are reviewed and a draft baseline is created at project start-up. Detailed specifications developed within the project execution process are baselined at approval to incorporate changes to the project scope. Of course, these changes may need to be approved by the Steering Committee.

## Managing Requirements Changes

A change control process is developed to ensure that the requirements of a project do not change uncontrollably as discussed in the Change Management section of this chapter.

The Project Requirements/Traceability Table is included in the Project Plan.

# Project Management Planning

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## Resource Planning

### Overview of Resource Planning

Every organization has a limited number of resources to perform tasks. A Project Manager's primary role is to find a way to successfully execute a project within these resource constraints. Resource planning is comprised of establishing a team that possesses the skills required to perform the work, as well as scheduling the non-labor resources (tools, equipment and processes) that enable the staff to complete the project.

Under formal project management methodology, project human resource planning is the first of four project human resource management processes. It is performed after the work breakdown structure is produced and enables assignment of resources to tasks in the project schedule. Additionally, it contributes to the planned purchase and acquisition of other resources required by the project.

### Determining the Size of the Team

The optimal size of a Project Team is driven by several principal factors. One is the total number of tasks to be performed, another is the number of types of skills required in the project, and an additional consideration is the effort needed to perform the tasks.

In developing the schedule and assigning the resources, the Project Manager determines the optimal mix of staff to activities. Doubling resources does not necessarily double productivity. For example, 365 engineers could not complete in a day a project estimated at one person per year. At some point, people begin to get in each other's way. The significance of the project duration, as well as each major activity's duration, needs to be clearly understood and documented as part of the scheduling process.

Adding more people to an activity creates the need for additional communication and may also increase the need for equipment or tools. Large teams require a significant amount of coordination and teamwork. Sometimes a smaller team can accomplish much more than a larger one in a shorter period of time. The optimal selection also depends on the personalities of the team members along with the communication and organizational skills of the Project Manager.

Adequate and timely personnel planning contain cost overruns. Having personnel on-board when they are not essential is extremely costly. It is important for the Project Manager to understand the size of the required team needed to perform the work on a week by week basis. For this reason, significant effort needs to be made in the planning process to identify the resources required to complete each task. Then, the Project Planning Team must determine when those resources are needed within the execution process.

### Determining Required Skills

Finding available staff with the skills required to perform a task is critical to project success. For example, some assumptions about the skills of the person performing the task are made by the

# Project Management Planning

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**Project Manager.** The skills of the people performing the work are directly related to the time it takes to perform a task.

Early in the planning process, develop a list of skills required to execute the project. This skills list is then used to determine the type of personnel required for the project and all the individual tasks.

During start-up, the Project Manager assesses the skills of the available people for the project. This process is called project staffing. The Project Manager's job is to determine the risks associated with the available skills and to build a plan that realistically accounts for those skills. Unfortunately, skill level is not a yes/no factor. People have varying degrees of skill, and the Manager needs to determine the level of schedule adjustment that should be made based upon the staff skill level. Significant concerns should quickly be addressed by management.

When skilled personnel are not available in the numbers needed, the Project Manager and Project Sponsor may plan to hire the necessary talent or contract services to perform the work or adjust the schedule accordingly. Typically, these decisions are made within the planning process of the project.

## Identifying Required Non-Labor Assets

All project teams require the tools necessary to successfully perform the tasks assigned. In scheduling resources, the Project Manager must ensure that both people and necessary equipment are available simultaneously.

The need for adequate work space is often overlooked when planning a project. If a 15-person project team is going to start work, there needs to be a facility to house the staff. Ideally, the team should be placed in contiguous space to facilitate interaction and communication. By having everyone working in close proximity, chances for project success are increased.

In addition to workspace, equipment for the team should be included in the plan. Assuring the availability of equipment at critical points in the project is important in planning a successful project. Also, technical support for equipment and software should be identified at this point. Efficiency and morale are negatively affected, and the project may be delayed, by the lack of equipment, information or support needed to perform a task.

## Resource Loading Profiles

A staffing plan is developed for each project. For small projects, this may be simply stated as the assignment of three people full time to the project throughout its six week duration. For more significant projects, the staffing plan identifies when and how staff is brought onto and taken off the Project Team.

A resource loading and staffing plan shows the number of personnel, by type, that are required on the project on a weekly basis. This information is compared on a planned versus actual basis.

# Project Management Planning

The chart and the graph on the following page are useful in the Project Plan for staffing projects and are to be included in the Project Management Plan. Then during the project execution process, these documents are updated and become part of the project status report.

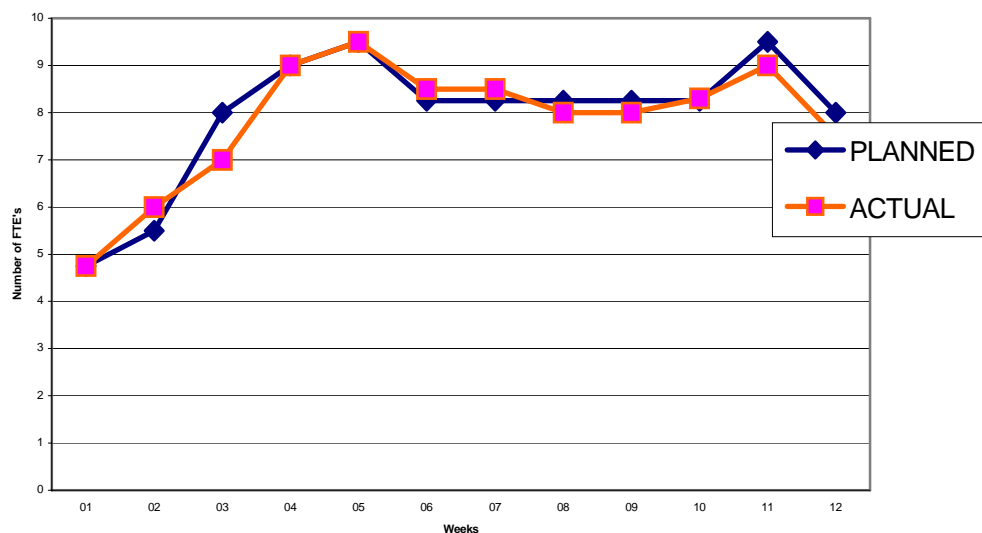
## Resource Loading

POSITION	Wk. 1	Wk. 2	Wk. 3	Wk. 4	Wk. 5	Wk. 6	Wk. 7	Wk. 8	Wk. 9	Wk. 10	Wk. 11	Wk. 12
Project Manager	1	1	1	1	1	1	1	1	1	1	1	1
SW Mgr	1	1	1	1	1	1	1	1	1	1	1	1
Sr. SW Eng.	1	1	1	1	1	1	1	1	1	1	1	1
SW Analyst	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	1	1
Programmer			2	2	3	3	3	3	3	3	3	2
Config. Mgr			0.5	1	1	1	1	1	1	1	1	1
Tech Writer	0.5	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Support	0.25	0.5	0.5	1	1	0.25	0.25	0.25	0.25	0.25	1	0.5
Steering Committee	.2		.2		.2		.2		.2		.2	
Sponsor	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
<b>TOTAL</b>												
<b>PLANNED</b>	5.05	5.6	8.3	9.1	9.8	8.35	8.55	8.35	8.55	8.35	9.8	8.1

POSITION	Wk. 1	Wk. 2	Wk. 3	Wk. 4	Wk. 5	Wk. 6	Wk. 7	Wk. 8	Wk. 9	Wk. 10	Wk. 11	Wk. 12
Project Manager												
SW Mgr												
Sr. SW Eng.												
SW Analyst												
Programmer												
Config Mgr												
Tech Writer												
Support												
Steering Committee												
Sponsor												
<b>TOTAL</b>												
<b>ACTUAL</b>												
<b>DIFFERENCE</b>												

## Staffing Plan





# Project Management Planning

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The graphic representation of the staffing plan helps to point out peaks and valleys in staffing that can present serious project management problems. The Project Manager realistically determines how a relatively consistent staffing level can be maintained. Particular attention is paid to releasing resources when they are no longer needed on the project. It is unrealistic to assume that the project can go from a 5-person to 10-person level of effort in a month and then return to a 5-person effort in another month. Resource leveling is supported by many project scheduling tools, but requires the special attention of the Planning Team in both the planning and the execution processes of the project.

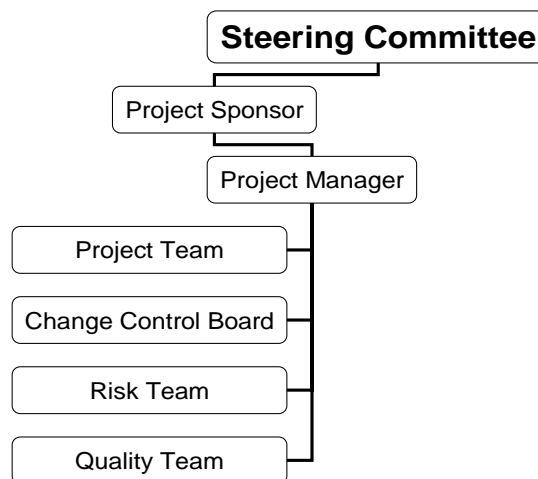
## Creating the Project Team Organization Chart

Project organization is used to coordinate the activity of the team and to define the roles and responsibilities of team members. Project organization is needed for every project, and a Project Manager must always be identified.

Confusion and lack of productivity are the result of poor project organization. This is where many projects run into trouble. A good organization facilitates communication and clearly defines roles and responsibilities.

There are numerous ways to organize a project, but all projects require a unique organizational structure. There are no standard organizational structures that every project should use. A sample organization chart for a large project is shown on the following page, with the types of functions that are often assigned to a project. Some projects update the organization chart to indicate those who will be attending the project status meetings and risk meetings.

## Sample High-Level Organizational Chart For a Large Project



# Project Management Planning

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The larger the project, the more critical the organizational structure becomes. In a small project, a single team member may be responsible for several functions, whereas in a large project the functions might require the full-time attention of several individuals. A very large project, for instance, often requires a Deputy Project Manager. A small project might have the senior technical staff member serving as a Development Manager. Definition of the project organization is a critical part of the planning process. In fact, it is really impossible to finalize the WBS until the organizational structure has been developed.

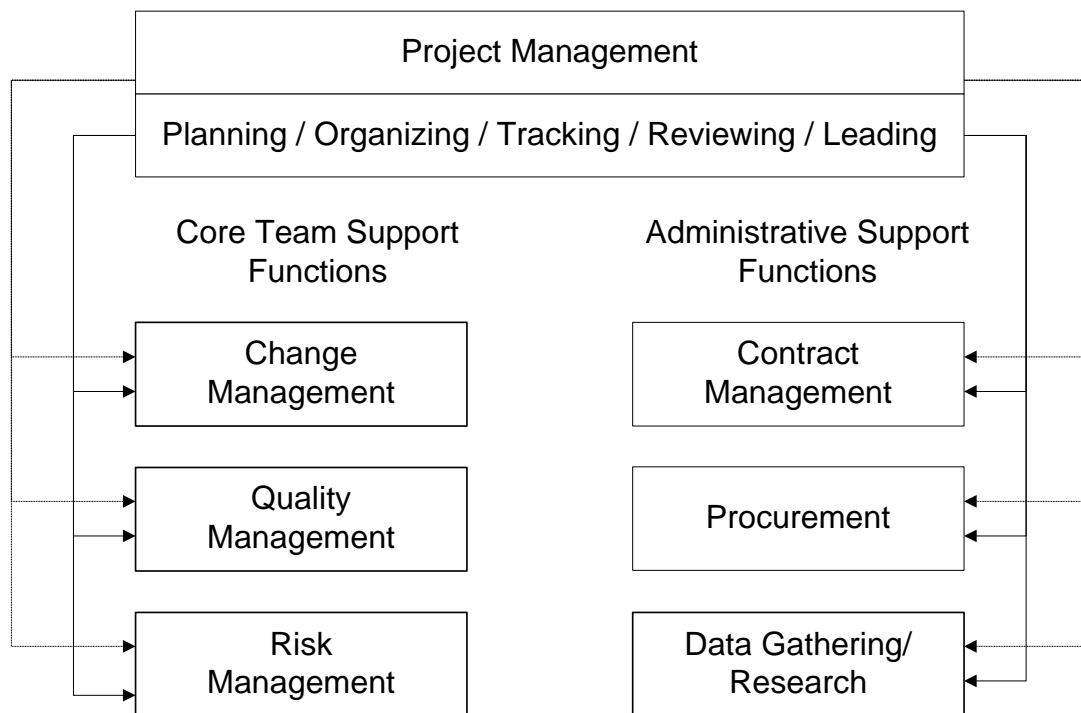
Project complexity also is a major factor when organizing a project. For example, a project that includes a large software development component typically includes a Software Development Manager. This allows for a concentration of resources on a high risk area. Unless a project is extremely small, it is useful to organize the project into functional teams. This approach leads to idea synergy and improved communications. The Project Manager is responsible for defining and selecting the team leaders. Team leaders can off-load some of the work of the Project Manager and take responsibility for completion of tasks. Team composition should be determined early in the planning process.

# Project Management Planning

## Project Management Functions

While the Project Manager, in theory, is responsible for all of the management tasks of a project, rarely can all of these tasks be performed by one person on a large project. In fact, some should not be performed by the Project Manager due to the time consuming nature of the function. These necessary support tasks can be divided into administrative and technical support functions and are shown in the following figure:

### Project Management Functions



Relationships can be dotted or direct to PM, except for QA, which should report outside of the project

The administrative functions are fairly obvious and can be further expanded to include scheduling and budgeting in very large projects. Within the technical support functions, change management ensures that changes to the product being developed are controlled. Quality assurance monitors the process of the products being developed. Testing or quality control verifies compliance of the product being developed to the stated requirements.

It is the Project Manager's responsibility to organize the project support groups and to document their planned activities. Documenting the assumptions made in resource allocation is critical to the later success of the project. Without clear documentation of these assumptions, later changes in the staffing are difficult and risky. If, for example, a key person with a specialized technical skill was assumed in the Plan, that assumption must be documented. Then, if that resource is unavailable to perform the task, the Project Manager can recognize the risk and make necessary decisions. Without documentation of the assumption, the Plan is open to serious risk without the Project Manager realizing it.

# Project Management Planning

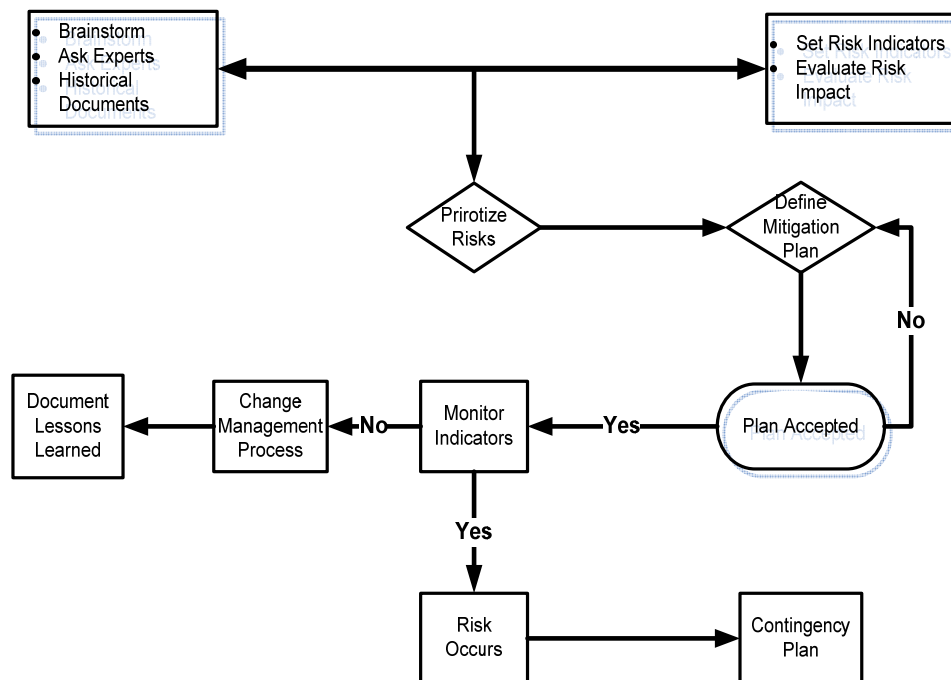
## Risk Management Planning

### Defining Risks

A risk is any factor that may potentially interfere with the successful completion of the project. Risk management recognizes that a problem might occur. When a problem does develop, it is no longer a risk. It is now a problem. By recognizing potential problems through risk planning, the Project Manager can attempt to avoid a problem or minimize the impact of a problem.

### The Risk Management Process

#### Project Risk Process



The procedure that the team will use to manage project risks is defined in the planning stage, documented in the Project Plan, and then executed throughout the life of the project. Risk management deals with the following risk processes:

- 🕒 Risk Identification
- 🕒 Risk Analysis, Quantification and Prioritization
- 🕒 Risk Response and Mitigation Planning
- 🕒 Risk Plan Execution
- 🕒 Risk Tracking and Monitoring

The Risk Management Plan (i.e. risk management worksheet) defines and documents the procedures used to manage risk throughout the project. In addition to documenting the results of

# Project Management Planning

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risk identification and analysis, it defines the plans for addressing the risk. This would include things like defining the responsibility for managing various areas of risk, defining how contingency plans will be implemented and how project resources will be allocated to handle risk.

Project risks are identified and carefully managed throughout the life of the project. It is particularly important in the planning stage to document risks and identify reserves that have been applied to the risks.

There are various areas of risk that can affect a project, including:

- 🕒 The technology used on the project
- 🕒 The environment in which the project is executed
- 🕒 The relationships between team members
- 🕒 How well the project fits the culture of the enterprise
- 🕒 The size of the change to the organization and the organization's processes
- 🕒 The experience and skills of the Project Team.

Risk identification consists of determining risks that are likely to affect the project and documenting the characteristics of those risks. Identify all possible risks that might affect the project, and focus on those that are most likely to affect the project's success.

## Identifying the Risks

All members of the Project Team can identify risk, but the Project Manager has overall responsibility. Sometimes a risk identification “brainstorming” session can help in the initial identification process. Such meetings help team members understand various perspectives and can help the team members better grasp the “big picture.”

Risk identification begins in the early planning process of the project. A risk management worksheet (shown later in this section) is started during the planning process. Then, as scheduling, budgeting and resource planning occur, the worksheet is updated to reflect further risks identified in the planning stage.

At project startup, the risk management worksheet is reviewed again, and any new risks are added to it. As the project progresses, members of the team identify new risk areas that are added to the risk management worksheet. Also during the project, risks identified earlier may go away. In any case, the total amount of risk should be decreasing over the duration of the project execution process.

Risks are documented so that contingency measures can be taken to mitigate their effects. Risks to both the internal and external aspects of the project should be tracked. Internal risks are those items the Project Team can directly control (e.g. staffing), and external risks are those events that happen outside the direct influence of the project team (e.g. legislative action, vendors, etc.).

## Risk Planning

Risks are inherently involved with scheduling resources. Sound resource planning makes allowances for dealing with risks in ways like the following:

# Project Management Planning

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- A common technique for risk planning is to add an additional WBS task for risk management/risk reduction, and financial reserves can be set aside to deal with potentially delayed schedules. The cost for this effort would be derived from assigning a value to the total risk hours from the risk analysis worksheet.
- Add time to those tasks where resources are known to be a problem. There is no rule of thumb for this multiplier; it depends on the degree of risk and the overall impact that resource problems can have on the project. Add a percentage time multiplier to the schedule for specific individuals, particularly if new technology is being used or if the person providing the estimate is extremely optimistic. Remember that staff typically underestimates the time required to do any particular task.
- Where skill shortage is identified, add time and resources for training. By recognizing resource shortfalls and providing the necessary training, a Project Manager mitigates some level of risk.

## Completing the Risk Management Worksheet

The risk categories/events shown on the risk management worksheet are provided for guidance, and do not represent an exhaustive list of types of risks. The risk categories/events should be customized for each individual project.

# Project Management Planning

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The Project Manager, with the support of the Project Team, then evaluates each risk event for the following:

<b>Loss Hours:</b>
--------------------

Indicate the expected increase in hours that will occur if the risk event occurs. This is also the number of hours it takes to “fix the problem” if it occurs.

<b>Probability:</b>
---------------------

Use the probability field to quantify the chance of the event taking place. Use a decimal value from 0 to 1 (e.g. .70). Normally, risk probability ranges from .1 to .4.

<b>Risk Hours:</b>
--------------------

This field represents the estimated risk for this event. The field is calculated by multiplying the loss and the probability fields.

<b>Previous Risk Hours:</b>
-----------------------------

This field represents the value of risk hours reported in the previous period of the execution process. A difference between this value and the current risk hours indicates a change in the risk status and is used to alert the Team and Project Sponsor that a change has occurred.

<b>Preventative Measures and Contingency Measures:</b>
--

The next two columns document the planned preventative and contingency measures that could minimize the effect of the risk event. The measures identified in the next figure are representative of common contingency measures but are not an exhaustive list. The Project Manager should provide specific contingency plans for each unique project.

<b>Responsible Person:</b>
----------------------------

The individual assigned to track, monitor or manage this specific risk.

<b>Comments:</b>
------------------

The comments column should be used to document items such as a change in value of risk hours from the previous period, management actions needed to contain risk and status of preventive and contingency plans.

<b>Total:</b>
---------------

The sum total of values in column four is the total risk hours for the project and should be reported in the Project Plan. This total should be multiplied by a blended burdened rate for personnel and included in the project budget.

# Project Management Planning

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## Risk Identification Number

Risk	Probability	Impact	RIN
Weather	5	7	35
Core team members change	3	8	24

## Risk Identification Number

The reason for using the risk identification number calculation is to attempt to quantify and qualify the level of risk being faced by a certain item. Once you determine the level of risk for an item, you can then take the planning steps to build contingency plans and mitigation strategies to handle as many of the risks as possible.

Calculate the risk identification number by multiplying the probability number by the impact number. This total will be the RIN for the level of identified risk.

Risk Identification Numbers can be preset by the organization or agency. Some organizations will state that a scale of 1-5 is for probability and a scale of 1-3 is for impact. Others will use a 1-10 scale for both probability and impact.

Example: Let's examine a risk on a scale of 1-10. Two risks have been listed: weather and the change of your core team members during the project. You have rated the weather as a 35 and the loss of team members as a 24. Both of these might be of great concern. You now can determine how you can eliminate, reduce or recover from this level of risk if it does take place.

## Risk Map

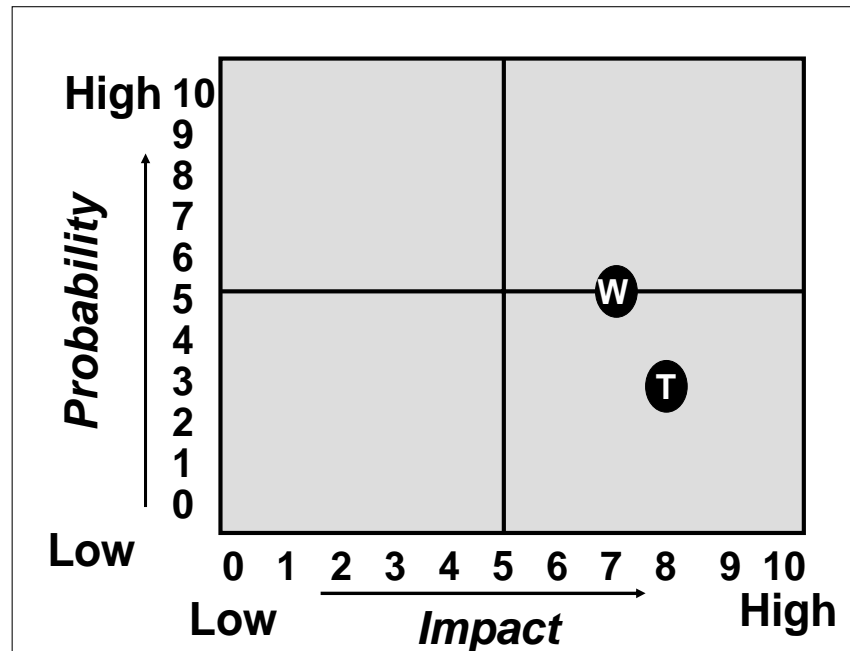
The Risk Map below is also used to assist in giving a visual description of the risk which has been identified in the RIN chart. The Risk Map shows the location of both risks on the map, and it gives a clear distinction of the location of the risks associated with this project.

Remember, risk can change throughout a project because of external conditions on the project and change orders which can increase or decrease potential risk. Both the Risk Identification Number and the Risk Map may be recalculated for particular risks.



# Project Management Planning

## *Risk Map*



## Contingency Planning

Contingency plans are developed as a result of a risk being identified and are pre-defined action plans that can be implemented if the risks actually occur. If a problem actually occurs, the Contingency Plan is then executed and risk reserves must be used.

As a guideline, contingency plans are developed for the top five to ten risks associated with a project. This could increase or decrease based on the size of the project. This is because of the observation that the top five risks will account for the vast majority of the overall project risk. For large projects the top five risks of each major sub-system may be actively tracked. To properly implement a plan, a risk reserve is required where dollars and/or time are held by a Project Manager to apply to the execution of a contingency plan. Without maintaining a reserve, the Project Manager is forced to go back for additional time or dollars for every risk as it becomes a problem. It is far more desirable to maintain a level of reserve where problems can be dealt with from within the original budget and schedule of the project. An example would be to calculate 10% additional budgetary funds to compensate for any risk which may become an issue.

There are some situations where nothing can realistically be done to prevent or deal with a risk. In this case, the project must be managed in such a way that the probability of the event occurring is minimized. If the event does occur, the Project Manager must re-plan the project and include the effect of the problem.

# Project Management Planning

## Risk Management Worksheet

A description of all risks identified for the project, the probability of the risk occurring, the impact of the risk on the project and the suggested mitigation activities

Last Risk Assessment Date:

Prepared by:

Ref #	Risk Category/ Event	Loss Hours	Probability	Risk Hours	Previous Risk Hours	Preventive Measures	Contingency Measures	Responsible Person	Comments
	<b>Personnel</b>								
1	Lack of knowledge in this hw/sw	200	.10	20		1, 2		Development Manager	
2	Insufficient resources available	400	.25	100		13		Development Manager	
	<b>Equipment</b>								
3	Delivery date slip	100	.25	25			3, 4	Purchasing	
4	Incorrect change	100	.15	15		5, 6	3, 4	Technical Architect	
	<b>Customer</b>								
5	Infighting	150	.2	30		7	8	Project Manager	
6	Unacceptable working environment	200	.3	60		9	8	Project Sponsor	
7	Third party involvement	300	.1	30		14, 15		Steering Committee	
8	Customer availability	250	.25	63		7, 16	29	Project Sponsor	
	<b>Logistics</b>								
9	Multiple customer sites	300	.2	60		20, 21, 22			
10	Physical separation of team and	200	.2	40		20, 21, 22, 23		Project Sponsor	

# Project Management Planning

	customer								
	<b>Organization</b>								
11	Inexperience team leader	200	.2	40		24, 25		Project Manager	
12	Customer people on team	300	.3	90		26		Project Sponsor	
	<b>Other</b>								
	<b>TOTAL RISK HOURS</b>			573					

**Risk Contingency Reserve:      \$22,920 at \$40 average hourly cost**

# Project Management Planning

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## Suggested Preventive and Contingency Measures

1. Provide appropriate training.
2. Hire trained specialists.
3. Install temporary hardware.
4. Utilize internal hardware temporarily.
5. Purchase additional equipment.
6. Implement product functionality in a phased manner.
7. Get agreement on who has decision authority; designate key customer responsibility.
8. Locate Project Team in our offices.
9. Negotiate better environment.
10. Ensure that all the resources are provided.
11. Get sign-off by Sponsor of Functional Specifications before development.
12. Unilaterally develop Functional Specifications.
13. Adjust deadline and get our customer buy-in.
14. Do not commit to third-party performance.
15. Get third party commitment at least equal to (if not more than) our commitment.
16. Get customer commitment to participate in the project.
17. Increase estimates for the related tasks.
18. Do not commit to response time unless absolutely necessary, and then only if a study is done by knowledgeable persons.
19. Establish access to product support personnel.
20. Hold regular meetings with customer.
21. Maintain constant written and oral communication with remote personnel.
22. Visit remote sites as needed.
23. Demonstrate incremental results.
24. Divide staff into teams and assign team leaders.
25. Dedicate our management resources.
26. Establish final authority of our Project Manager.
27. Use proven hardware for development, if possible.
28. Reduce functionality to meet deadline.
29. Document our assumptions and understandings and get customer's sign-off before investing substantial resources.
30. Design an alternate (contingent) solution strategy.

# Project Management Planning

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The following type of chart can also be used as a way to summarize the top risks. This type of report focuses the Steering Committee and Project Management Team on the key issues:

## ***Risk Summary Report (Top Five Risk)***

Category	Prob	Imp	Risk	Mitigation Approaches
<b>MANAGEMENT</b>				
Personnel Availability	High	Med	Personnel developing the system did not participate in the design effort, resulting in less understanding of the system functionality.	Ensure that specifications/overview documents contain sufficient information to allow new personnel to understand system.
Personnel Skills	Low	High	Personnel assigned to project will not have skills to perform work	Since contractor provided quality personnel in design effort, anticipate that skills will be met.
Schedule	Med	High	Completed system (i.e., the system ready for use) not delivered within 18 month timeframe.	Break project into smaller segments to ensure schedule being maintained.
Cost	Med	High	Proposed budget does not reflect all required activities.	Review costing to ensure that all state organization activities reflected.
Change Control	Med	Med	System requirements will change during the development time.	Ensure that a change control process is established that limits changes to those essential to business

Legend

Prob = Probability of Occurrence

Imp = Impact

# Project Management Planning

## Other Planning Documents

### Top Five Issues

This form identifies the top five issues that have been identified for a project. It defines the person responsible for resolving the issue and an associated open and a planned close date, with proposed or recommended solutions.

#### *Top Five Issues*

Issue Description	Responsible Individual	Open Date	Closure Date	Status
Change order pending for AP processing	A. Smith	4/5/XX	5/1/XX	Estimated release date 4/15/XX
Enhancement number 1 inactive; requirements still not defined	D. Hall	4/1/XX	5/1/XX	Awaiting input from Jim who needs to meet with Bob on 3/15/XX
Out of scope item on month end processing must be decided	A. Smith	2/15/XX	3/1/XX	Determined effort was out of scope. No action to be taken.
Change item status reporting system not yet installed.	B. Jones	1/15/XX	1/25/XX	System installed and operational. Baselines entered into CM.

### Issue Item Status

The Plan should include a list of issues that are maintained by the Project Manager. A sample table is shown below. Issues should be expected to surface, and sometimes frequently, in projects. When they surface they should be reported immediately to the Project Manager and should also be documented in an issues log so they may be traced. Early intervention when dealing with issues often results in non-escalation of the issues into larger problems. The key is to manage issues at the lowest level possible. This will help prevent avoidable project delay, help build project team credibility as problem solvers, and help prevent avoidable use of more senior management's valuable time.

#### Issue Status

Issue Item #	Issue Description	Responsible Individual	Open Date	Closure Date	Status
0001	Document flow for hardware acquisition	R. Smith	8/1/XX		Developing flow
0002	Check status of subcontract agreement	B. Hill	8/2/XX	8/4/XX	Signed and executed
0003	Organize team meeting to review support requirements	M. Jones	8/1/XX	8/2/XX	Meeting scheduled for

# Project Management Planning

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					8/12/XX
0004	Contact W. Smith regarding coordination of delivery	B. Hill	8/3/XX		
0005	PMP updates past due	C. White	8/4/XX		Required by 8/1/XX

## Action Item Status

A similar chart as the one above can be used to show action items that need to be tracked at the beginning and throughout the project. Action items are important items but are typically too short in duration to be included as a work assignment.

## Project Management Plan Form / Template

The form designed to document the Project Management Plan is PM-02. A copy of a blank form is located in Appendix B.

## Project Management Plan Example

An example of a completed Project Management Plan is located in Appendix D. This example is included to indicate how the document should be completed. It does not necessarily reflect a perfect example or an ideal model.

# Project Management Planning

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## External Project Manager Plan

Often, an organization will contract the completion of projects to outside firms who bring in their own Project Managers. In this case, the contracting organization often believes that an internal Project Manager is not required. This incorrect assumption leads to disappointment or outright project failure. It is rare that all project risks can be deflected, or contractually transferred, to an outside firm.

The internal Project Manager needs to make sure that the vendor Project Manager has defined the project correctly and to your satisfaction and that you have formally approved it. The internal PM and the vendor PM must both have a complete Project Plan to ensure that all resources are assigned efficiently and that all parties are effectively working toward the same goals.

As the project moves forward, the internal Project Manager must be aware of the key milestone dates. There should be a formal checkpoint to ensure that the deliverables produced up to that point are complete, correct and on time.

If there is a partial payment being made at a milestone, the internal Project Manager needs to ensure that the criteria for payment are defined before the work begins. Generally, the internal Project Manager should require regular status meetings and formal status reports from the vendor Project Manager.

The questions an internal Project Manager should ask at the beginning of the project include:

- ✧ Is there a clear and mutual understanding of the project charter?
- ✧ Is there a contractual agreement that spells out the expectations of both parties in terms of deliverables to be produced, status reports, deadlines, payment schedule, completeness and accuracy of criteria, etc.?
- ✧ Has a comprehensive Project Plan been created and approved?
- ✧ What procedures will the vendor use to control the project?
- ✧ Has the vendor's resource requirements been clearly defined? Has the timing for those requirements been defined?
- ✧ Have a number of milestones been established to review progress and validate that the project is on track for completion?
- ✧ Has a related payment schedule that is tied to milestones or some type of earned value measure been defined?
- ✧ Have the project short-term success factors been clearly defined and mutually agreed to?



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